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TRANSACTIONS

OF THE

KENTUCKY STATE MEDICAL SOCIETY

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LOUISVILLE, KY.

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OF THE

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TRANSACTIONS

OF THE

KENTUCKY STATE MEDICAL SOCIETY.

THE PRESIDENT'S ANNUAL ADDRESS.

JAMES H. LETCHER, M.D.

HENDERSON.

Mr. Chairman, Members of the Kentucky State Medical Society, Ladies and Gentlemen: It has become an established rule, co-existent with this organization, for the President to deliver an address at this time. When I see before me such numbers of distinguished men, men who could interest you more than I, and, above all else, who deserve far more than the speaker this great honor, I can but deeply wish some such one were now in my place. Even if not conscious of my inability to interest you, I would feel some timidity in addressing you here, where for long years has been and still continues to be the home of so many distinguished physicians and surgeons—Kentucky's gifted sons. Or how glad would you be to lift the veil of the past and listen to the eloquence of a Gross or Yandell, the wit of a Palmer, the philosophy of Drake, Flint, or Miller; but it has been decreed otherwise.

Will you not pardon me if I do not confine my remarks to some technical subject, and allow me scope to touch upon several thoughts that may prove of interest? First, permit me to express my most sincere thanks for the honor bestowed in electing me as your presiding officer, the greatest honor that can be conferred on a Kentucky doctor by Kentucky doctors. Our thanks are also due your Committee of Arrangement for the delightful preparation made for our comfort and entertainment, and to the Pathologic Committee for their large, interesting, and instructive exhibit. But, above all, let us thank our

Creator, not alone for the manifold blessings he has showered upon the members of this Society during the past year, but upon our State and nation during all the years gone by, and, acknowledging allegiance to Him, pray that He may give us grace to follow always closely in the footsteps of the Great Physician.

The dense ignorance of the laity in all things pertaining to the healing art, and their credulity as regards the potency of so-called remedial agencies, renders it easy for the quack and nostrum-vender to ply their varied avocations, and thus impose upon the masses.

Education is the only remedy for such ignorance, and it rests with the medical fraternity and all other educational organizations to form a combination and act in unison against the common enemy. I regard the great public press as the main factor in this work, as the newspapers go into the homes of all, and both our daily and weekly papers should set aside a column or two in each issue for the promulgation of medical knowledge. The public should be taught the laws of sanitation and warned against the dangers not only of the indiscriminate and inordinate use, but of the use at all of patent nostrums.

We are constantly reminded of the importance of a union of effort to aid in the defense of those who, in their endeavor to shield the public against the machinations of the quack and empiric, are made the defendants in suits in civil action, as well as a union to protect ourselves against unjust, iniquitous suits for alleged malpractice and against blackmailing schemes, etc.

Only last year, in an attempt to protect the reputation and honor of our profession, as well as the health, happiness, and comfort of his unsuspecting neighbors against a pretender, a member of this Society was forced, single handed and alone, to engage in prolonged and expensive civil action for damages. With a proper organization this suit would have proven a trivial matter, or possibly the plaintiff, knowing that the defendant would have both the financial and moral support of the united profession, would not have dared enter suit. Our co-worker deserves credit for the stand taken to uphold the dignity and good name of our calling, and we should feel it a duty and privilege to reimburse him, in a large part at least, for the outlay of money thus made.

And this case emphasizes the importance of our effecting a "Medical Defense Association," the object being to defend its members against blackmail, and not, of course, to render service to any

guilty of malpractice. To be eligible for membership in the Union, one should become a member of the State Society. This subject is receiving attention in many sections of the world, and I would suggest the appointment of a committee to take it under advisement.

A word touching the importance of a more complete general organization of the profession, or rather of a more vital connection between our existing medical societies. Beyond county organizations we do not need more medical societies, indeed could well dispense with several we have, but need a union, a oneness of those existing. There should be an intimate, a dependent relationship between our national, State, county, and municipal associations.

Several State societies have recently reorganized after the Connecticut method, the most approved plan, which in a word makes membership in the county or other local society carry membership in the State association, and that without additional expense. A plan is suggested for adoption by one of your former presidents, Dr. J. M. Mathews.

Among other important changes needed I will only mention that of separating the scientific and legislative work of the Society, so that the latter division would be composed of a much smaller and yet representative body. The various State societies, with the thought of reciprocity, should adopt constitutions and by-laws, made upon a common plan, differing in minor matters only, as the exigencies of local interests may require. So, too, this federative idea should hold as regards county and other local organizations.

The profession generally is awakening to the importance of strengthening the ties between the various societies, and to that end the "American Medical Association" at its last meeting appointed a committee on organization, having a representative from every State and territory in the Union, and a small committee of three (of which an honored member and ex-president of this Society, Dr. J. N. McCormack, Bowling Green, is Chairman) to formulate plans for the consideration of this large committee and of the national society.

If we still wish to keep pace with every improvement we must change our present methods, and a committee should be appointed at this session for that purpose and to co-operate with the "American Medical Association" in carrying out this general idea of reorganization.

In the years to come doubtless a president of this Society will mention the names of some of the distinguished medical men of the State

now living, who have done so much to bring honor and renown to Kentucky, not a few of whom are now in the sound of my voice. It would not befit this occasion for me to do so; but, entering upon this new century, I will cite a few facts (all of which perhaps are not generally known to the profession) in the lives of several of the leading pioneer surgeons of our State, who richly deserve to be remembered, not only by Kentuckians, but by the medical profession of the civilized world.

We seem to forget, or perhaps some do not know, that there is not a State in the Union that has done more, aye! as much, as has our grand old Commonwealth for American surgery. When we remember that at the beginning of the century just closed Kentucky as a State was but eight years old; that but twenty-six years before the first company of hardy emigrants, with Daniel Boone as their leader, settled at Harrodsburg, there was not a medical school on the continent save the "University of Pennsylvania," organized 1765, "Columbia College" (1768), Harvard (1783), and Dartmouth (1797), all great distances from here, and that we had no medical literature, it is marvelous what our forefathers accomplished.

In mentioning the names of a few of our many distinguished dead, with uncovered and bowed head I feel that I stand on holy ground, and am sorry that one with tongue more eloquent should not thus attempt to do them honor.

DR. WALTER BRASHEAR.

The subject of this sketch was born in Prince County, Maryland, February 11, 1776; married Miss Margaret Barr in Lexington, Ky., in 1802, and died in Louisiana, October 23, 1860, where he is buried.

His father came to Kentucky when Walter was eight years of age, settling on a farm on Salt River, near Shepherdsville.

The boy was given the best education possible at his home, and at the age of twenty years went to Lexington, matriculating at Transylvania University. Remaining in Lexington two years, he made the then long horseback journey to Philadelphia, where he entered the University of Pennsylvania. After one course of lectures in Philadelphia, a nomadic spirit carried him to the far eastern country of China, and while there he acquired considerable fame by removing a mammary gland from one of the female Celestials.

It was after returning to his native heath that he immortalized himself by doing the first successful amputation at the hip-joint in

America, and perchance the first in the world. This operation was performed on a seventeen-year-old mulatto slave boy in Bardstown, August, 1806, the boy living for many years subsequently.

Dr. Brashear practiced the circular method, securing the blood-vessels, then making an incision over the major trochanter and bringing the head of the bone through this opening.

We can well imagine the courage necessary to undertake at that time, and with such surroundings and assistance (practically no skilled assistants), so great an operation.

Dr. Brashear moved to Lexington in 1813 and soon attained distinction in his profession, but remained there only nine years, when he went to St. Mary's Parish, Louisiana. Here, seeking his fortune as a planter and merchant, both proving financial failures, and engaging

somewhat in politics, he abandoned his profession, only rendering service occasionally to his neighbors, and then gratis.

He represented Louisiana in the United States Senate, and was a man of great professional and personal popularity.

EPHRAIM MCDOWELL.

The one man who brought the greatest fame to Kentucky, by whose deed a greater number of years have been added to human life than by the work of any other surgeon, dead or living, was Ephraim McDowell.

The introduction of the religious teachings of Charles the First of England were so objectionable to Scotland that in 1638 that grand body of men known as Covenanters was organized, and from this stock came Dr. McDowell. His father, Samuel, was born in Virginia, October 29, 1735; married Mary McClung; distinguished himself in the Revolutionary War, and was appointed by General Washington the first Marshal of Kentucky. Dr. McDowell's family possessed elements of worth. His brother, John, was an officer in the War of the Independence as well as the War of 1812. His brother, William, was United States Judge for the District of Kentucky, and married Margaret Madison, sister of James Madison, ex-President of the United States. His brother, Joseph, was an officer in the War of 1812, and General Shelby's Adjutant-General at the battle of the Thames in Upper Canada, where Tecumseh, the celebrated Shawnee Chief, was killed. His sister, Martha, married Colonel Abram Buford, of Revolutionary fame; his sister, Mary, married Alexander Keith Marshall, brother of the late John Marshall, Chief Justice of the United States.

James G. Birney, who was the abolitionist candidate for President in 1844, and whose nomination resulted in the defeat of Henry Clay, the candidate of the Whig party, married Agatha McDowell, a niece of Dr. McDowell.

Dr. McDowell possessed an excellent physical constitution, being a trifle less than six feet in height, had a striking face, black hair, ruddy, healthful complexion, elevated and rounded forehead, heavy arching eyebrows, rather large dark eyes, nose inclined to be heavy but well proportioned—a blending of the Grecian and Roman—a somewhat large, expressive mouth, and a broad, well-shaped under-jaw. Although being heavier than the average man, yet during his whole life he was brisk and active. He was a man of rare simplicity of character; one of

his most striking peculiarities being quite a modest estimation of his own worth, having no desire whatever for power or fame, and seeming to be content in performing, in the best possible manner, the duties of every-day life. Not only was he perfectly free from that stiff, unbending reserve so often met with in men of genius, but evidently lacked that air of dignity which should adorn one of his character and profession. He possessed a happy disposition, brilliant wit, polished manners, generous feelings; was a kind father, indulgent husband, and excellent citizen.

Dr. McDowell's advantages for acquiring even a common school education were not great, and from the style of his writings, as appeared in his only three contributions to medical literature, we infer that his early education must have been limited. He attended private schools in his own and neighboring counties, and the honorary degree given him by the University of Maryland in 1825 was the only degree it is positively known that he received.

He spent several years at Staunton, Va., as a student of Dr. Humphrey, who was a graduate of the University of Edinburgh, and went from there to Edinburgh himself in 1793, matriculating at the same university. There he became also a private pupil of the eloquent and earnest Mr. John Bell, and it is said that the latter gentleman inspired Dr. McDowell with the idea that the operation that afterward made him famous might be accomplished. After two years in Scotland he returned to his old home in Danville.

In 1802 he was married to Sarah, a daughter of Kentucky's first Governor, Isaac Shelby, an accomplished, amiable, and estimable lady, who was in every way fitted to make his home attractive. She was granted the privilege of administering to his happiness and comfort during the remainder of his life, surviving him about ten years.

I will not speak at length of the operation, the crowning achievement of his life, and that made Dr. McDowell's name familiar with the medical profession all over the world; suffice to say that in 1809 he successfully removed an ovarian tumor weighing 22½ pounds. The patient was Mrs. Crawford, age forty-seven years, of Green County, this State, and she lived for thirty years afterward; and because of this procedure he has been justly known as the "Father of Ovariotomy," as he was the originator of abdominal surgery. (Mrs. Crawford's son afterward became Mayor of the city of Louisville.) The old house where Mrs. Crawford was operated upon still stands in Danville, and I

had the pleasure but a few days since of being shown the very room where the first ovariotomy was performed. The proof of Dr. McDowell's claim for priority in this procedure is so conclusive no fair-minded man can doubt it. The total number of such operations known to have been performed by him were thirteen, with eight recoveries.

Dr. McDowell did a large and select practice, much of it being general surgery, and was oftentimes called long distances from home. He operated a number of times for vesical calculi. One of his clients, then in 1812 a young man, James K. Polk, of Tennessee, afterward became President of the United States. He was elected an honorary member of several medical societies, owned a good library, and kept well abreast of the profession.

From an early day he possessed thorough Christian convictions, but did not become a member of a church until 1828, then joined the Episcopal Church. He was, from its organization, an earnest supporter of the Presbyterian College, "Center," in Danville.

Dr. McDowell was a native of Virginia, born in Rockbridge County, November 11, 1771; died at Danville, June 25, 1830, where his remains rest on a square of ground given by that city, and under a handsome monument erected by the women all over the country who have been blessed because of his work, and by others who love to revere the memory of the great and good.

In the whole history of medicine none can be found more deserving of our admiration and love than McDowell. We can look back and see no brighter star in all the medical galaxy than was he. It was the luminous glance of his genius, "like the splendor of the golden bough that bore the Trojan hero through the darksome regions of the nether realms," darting through the branches of the tree of medical knowledge gilt with a new light the sombre leaf of ovarian disease.

Dr. Charles McCreery

Was of Scotch-Irish descent, his grandfather, John, coming to this country and locating in Maryland in 1720. His father, Robert, moved to Clark County, Ky., where the subject of this sketch, the seventh son and youngest of nine children, was born, June 13, 1785.

Dr. McCreery was an uncle of the late Senator Thomas C. McCreery, and great-uncle of ex-Gov. James B. McCreery. He married Ann Wayman Crow, of Maryland, and settled in Hartford, Ohio County, where he spent the remainder of his life. Dr. McCreery did a large

practice in Ohio and adjoining counties, making extended rides horseback, and yet found time to deliver lectures regularly in his home to his own students as well as students of others. His surgical instruments were made under his own supervision by an expert silversmith in Hartford.

His chief operation, the one that makes his fame enduring, was extirpation of the entire collar-bone in 1811, the first of which record is made.* This operation was done upon a young man, and though the bone was said to have been scrofulous, was a decided success, the patient making a perfect recovery with perfect use of the arm and living past middle life.

The case of Dr. Valentine Mott, of New York, performed in 1828, which Dr. Mott supposed was the first operation of the kind done in the United States, and about the wonders of which surgical writers at that time said so much, was not a complete removal, for about one inch of the acromonial end of the clavicle was left.

Dr. McCreery was a fine historian, a great reader, eloquent speaker, ready writer, and close student. The love of his patients for him bordered on idolatry, his name being to them a synonym of kindliest sympathy and readiest helpfulness. His home life was characterized by unusual sweetness and tenderness, and an intense appreciation of child nature. He was a finely-formed, handsome man with noble brow and fine dark eyes.

Dr. McCreery died of cardiac dropsy August 27, 1826, at West Point, on his return from Shelbyville, where he had gone to bring his two oldest daughters home from Science Hill Academy. I have had the pleasure of visiting his grave at Hartford, which is handsomely cared for by his grandchildren, and he need not to have uttered the prayer, "Lord, keep my memory green."

Benjamin Winslow Dudley,

of Lexington, known as the greatest lithotomist of the nineteenth century, the "Surgical Patriarch of the West," was one of the most distinguished surgeons of his day. He was one of the organizers of the Medical Department of Transylvania University, its master spirit, and its Professor of Anatomy and Surgery. He was also, in 1850, the founder of the Kentucky School of Medicine, having organized its faculty, of which he remained a member for several years, and remained

*Case reported in full by Dr. Johnson in January, 1850, number New Orleans Med. and Surg. Journal.

with it until he was sixty-five years of age (1857), when he moved to his farm to pass the evening of his life.

After graduating at the University of Pennsylvania in 1806, he spent several years abroad, most of the time in London and Paris, where he gave especial attention to surgery, as taught in the schools and hospitals of those medical centers. He returned to Lexington, which place was soon recognized as the seat of learning of the West, not only medical, but legal and clerical also; the home of Robertson, the Breckinridges, Clay, and others.

While Dudley did general surgery, treating especially and successfully traumatic epilepsy by trephining, his chief field of labor was with the bladder. He did two hundred and twenty-five lateral cystotomies for vesical calculi with the loss of but three patients, not having a death in his first one hundred cases. Judging from his method, one must believe that he had a clear perception of asepsis and antisepsis. His chief reliance was upon thorough cleanliness, the free use externally of warm, almost hot, water that had been boiled, and internally of what he supposed was pure cistern water. An Englishman, alluding to Dr. Dudley, is said to have remarked "that it had been reserved for a backwoodsman of America to teach how to prepare the patient for a capital operation. He justly claimed to have first cured a case—and it was a formidable one, too—of intracranial aneurism by due preparation and ligature of the carotid. No one ever did so much with the roller, relying upon it even in fractures, of which he was emphatically the master."

He contributed but little to medical journalism, was accurate in diagnosis, of fine mental equipoise, gentle and kind, yet resolute, and of a quiet temper. Dr. Dudley was born in Virginia in 1785, the same year that gave birth to Dr. McCreery, and died in Lexington, January 20, 1870, where rest his remains.

Aside from these, many other of the earlier members of our profession became eminent, but time and your patience will not allow me to tell you at length of Dr. Allen Goldsmith, who, in Lincoln County, in 1829, performed for the first time in the United States lithotripsy; of Dr. John M. Briggs, of Bowling Green, who in 1830 for the first time in this country did hysterectomy; or of Dr. Mosely, whom Dr. Ely McClellan, of Philadelphia, told me carried out the principle of "Esmarch's bloodless operation" about sixty years ago; or of Dr. Benjamin G. Bowman, of Harrodsburg, to whom may almost safely be given the

credit of inventing the hypodermic syringe, the use of such an instrument by him as early as in 1824 having been witnessed by Dr. C. S. Abell, aged eighty-four years, still living; or of Dr. Joseph Taylor Bradford, of Augusta, who was the most successful ovariotomist of his day, 90 per cent of his cases during that early period (1840–70) recovering. Still other surgeons have acquired distinction, and I will merely give you the following names of a few of the many, but it would be impossible to do it in the order in which they deserve mention. Most of them are products of Kentucky soil, while others spent a great portion of their lives with us: Samuel D. Gross, Joshua Barker Flint, George Wood Bayless, James Miles Bush, T. G. Richardson, Ethelbert Dudley, John Daviess Jackson, David Wendell Yandell.

As a matter of historic interest, I will say that Dr. William Loftus Sutton, of Georgetown, was the first President of this Society, in 1851. Dr. John Lawson McCullough, of Lexington, was the first to receive the M. D. degree from a school west of the Alleghanies, that being from Transylvania in 1809. Dr. Hart was the first doctor known to have come to and settled in Kentucky, he from Maryland in 1775, to Harrod's Station, and later to Bardstown.

These great intellects were held in high esteem in their respective communities, and there could not have been found then, as now, men in any calling who were truer, bolder, yet conservative, more noble, more self-sacrificing, more progressive, more devoted to their country, more earnest in their desire to benefit mankind. They shall ever continue to live in history, because by their deeds they did something for the welfare of their fellow-men. All these add luster to Kentucky's fame, and from the light of their genius we should find inspiration to emulate them in their labors and accomplishments. Let us, with well-directed and untiring zeal, with an earnest purpose born of a desire to be of service to those now living and to come after us, labor to become worthy successors of these great men who bore the burden and heat of the day.

Though so much has been accomplished during the century just closed, we stand at the early morning of possibly the greatest epoch in the history of our calling, and to the men young in the profession at the beginning of this century I would suggest that if you will wear well the mantle—as did Elisha that of Elijah—of these great men gone before, you must "spurn delight and live laborious days." To you an inspiration comes from the graves of the dead and from the deeds of

the living, kindling hope and ambition to emulate their fame and to do their works, or even greater work.

If you do not want to go down in the battle of life with the army of unnumbered names, then work, work, and write your name high in the temple of fame. Live for others, remembering that "nothing in nature, much less conscious being, was ere created solely for itself," and let the world be better for your having lived.

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THE NECESSITY FOR MEDICAL ORGANIZATION.

J. N. McCORMACK, M.D., LL.D.
BOWLING GREEN.

Although the American Medical Association has been in existence for over fifty-four years, and some of the State Societies even a little longer, only about one in ten of the medical men in this country are members of the former, and but one in three—chiefly confined to a few States and centers—are in affiliation with either their State or county societies. This bare statement of facts is a criticism of professional leadership and management which should be frankly met and honestly investigated. Your essayist believes that the reasons for this condition of affairs, so discouraging to those with high ideals, are not far to seek.

Taking our own State as a fair example, it may be truthfully said that no serious effort has ever been made at organization. It is true that all that has been done or attempted for the elevation and advancement of the profession, and the consequent good of the people, which are inseparable, has been in the right direction, but there has been little or none of that comprehensiveness and uniformity of plan or of concert of action between societies and individuals working with the same ends in view essential to the best results.

What is the condition of the average Kentucky doctor? Outside of a very limited number of counties it is neither an enviable nor an inspir-

ing one, and this is as true of a very large element living here in Louisville as of those in the town and country districts. Suppose we take the experience of the recent graduate, or of either of you starting out in life, and make the application general. This will fairly epitomize the evils so widely prevalent. As a rule, he has left his half-equipped alma mater, where criticisms and ill-concealed misrepresentations of similar and better schools and faculties were in the atmosphere, none too well trained for his high calling and responsibilities, but ambitious to learn and craving the fellowship which he correctly feels and believes to be essential to practical knowledge.

His location chosen, he is fortunate if he is not met at the threshold, the most impressionable period of his medical life, with covert sneers or complete ostracism from those already established in practice. This hostility will be short-lived if he proves a failure, but will grow in virulence and threaten to become a consuming flame if he succeeds. With time he is likely to find that many of his professional neighbors, and especially those most intolerant, practically laid down their books at graduation; that they receive no new literature except the "Brief" and other free copy advertising periodicals; that they have little or no equipment for even the emergency surgery they must do, and that so much of their time is taken up with petty jealousies and bickerings as to destroy all real professional pride or proper desire for advancement. He will find them ready to quarrel about patients who would not pay either of them, or about provisions of the Code which neither of them have read; that one is afraid to collect his bills for fear the other will inherit some of his offended patrons; that ambition in surgery or other specialties is held in abeyance by the fact that those who should be his professional friends will send for consultation, or send patients to a distant town or city rather than ask his assistance, no matter what his qualifications may be; and that an unfortunate result after an operation, which might happen to any one, would be widely heralded to his discredit; in a word, that this curse of envy, which clings to our otherwise great and noble profession with such tenacity, and blights all to which it clings, tends to destroy his ideals, his happiness, and his usefulness.

Physicians need each other's advice, help, and upbuilding influence as no other men can do, and yet he finds that this spirit of contention, pitched upon the lowest possible plane, so infects and divides the people in nearly every community as to be utterly destructive of that

public respect and confidence which all should co-operate to deserve. With such environments the horizon of our graduate, probably never large, grows smaller and smaller with the years, until, unless he be above the average, he drops out of the race and becomes the unkempt and self-satisfied medical degenerate to be found on every hand.

It is mainly the condition so imperfectly described here which causes most of the poverty in the profession, interfering with it in every business aspect, just as the loss of public respect and confidence, directly traceable to it, accounts for most of our difficulty in securing needed medical and health legislation, and in the enforcement of such laws as have been enacted. Dr. Jones and Dr. Smith may both be good men and reliable physicians, but if each of them confidentially informs everybody every day that the other is not only ignorant but dishonest, the community will finally agree with both of them and rate the entire profession accordingly. This picture is not a pleasant one, but, sincerely believing that these glaring and deplorable evils result from faults in our organization and methods which are entirely remediable, your essayist has painted what he finds, hoping that the defects may be cured and that some future worker in the same field may be able to paint a glorious counterpart, representing our great guild redeemed from its hereditary curse of envy and jealousy.

The seggregated life universally incident to the practice of medicine has brought upon good and bad alike this Iliad of woes, and the only remedy which promises relief is such a systematic, all-pervasive organization, beginning with the county societies as the broad foundation, and extending up through the State societies to the American Medical Association, as will bring physicians together constantly. A strong effort in this direction has been under way in England and in several States of this Union for several years past, with promise of most excellent results, and the time has come when the profession of Kentucky must join actively in the movement or lose prestige.

As Chairman of the Committee on Organization of the Association, it will be my privilege to report a scheme for such an organization at the St. Paul meeting next month, which will, if adopted and carried out, attempt to reach and influence every medical man in this broad land. We will propose that the county society shall be the basis upon which the entire system shall rest, and that every member of his county society shall, without additional fee or application, become a member of his State society and receive its publications, with the privilege of

attendance and participation in its proceedings, and of coincident membership in the American Medical Association, if he desires this. In other words, we will propose that the county society shall be the portal to our entire society system, with no after-questions of one who is in good standing with his neighbors.

While every member of a county society will have the privilege of attendance on his State society, it is proposed that each county shall send one or more delegates to the State society, who shall, collectively, compose a "House of Delegates," and have charge of the legislative and all other material interests of the profession. Thus while the larger body is engaged in the reading and discussion of papers and other scientific work, as now, the small delegate body, representative and selected for this especial purpose, may devote so much of the entire three or four days as may be necessary to legislative and business matters.

Similarly, it is proposed that each State society, in proportion to its membership, shall elect representatives to the American Medical Association, who, collectively, shall compose its "House of Delegates," and sit during each annual meeting to consider the business and material interests of the profession of the entire country, while the various sections are doing the scientific work for which they were created. The membership in this business body of the Association will be limited to one hundred and fifty members, one half of whom will be elected annually for a term of two years, so as to make it a continuous body. In all of these bodies the house of delegates will act as the nominating committees, and, in order to effectually guard against political combinations, against perpetuation in office, and self-election to office, it is proposed that no delegate in any body shall be eligible to any office to which it elects. In each State society and in the Association this will give a compact business body, representative of the entire profession for which it acts, with ample time to consider all material matters, which are now slighted or ignored for want of time, without interfering for one minute with the much larger number of members who attend for scientific work only.

In such a scheme, that part of it which relates to the organization and maintenance of county societies, or an aggregation of counties in some sparsely settled districts, will be at once the most important and the most difficult. For obvious reasons, it has always been easy enough to have leading men attend and keep up the interest in the State societies

and the American Medical Association, but the difficulties are greatly increased when we come to face the problem of making the frequent meetings of local societies sufficiently harmonious and interesting to maintain the requisite attendance month after month and year after year. Yet this is done with most excellent results in some States, and in a few counties in all the States, and is possible everywhere. The difficulties are on the surface, and will disappear if frankly and courageously met.

In the first place, the dues should be so increased as to put ample funds in the hands of the State Society. Then some active young man, with tact and organizing capacity, who can devote his entire time to the work, should be employed for a few years to visit and systematically organize the profession in each county until the entire State has been covered. Scores of private orders and guilds with little apparent reason for existence are doing this successfully everywhere, while our profession, with interests not only involving every member, but the entire public as well, on account of a faulty system allows a large majority of its nominal members to drift along with no higher ambition than the mere means of subsistence.

With such an organization as is here briefly outlined all things that could be reasonably desired become possible to us, and through us to the people, for whom, as regards all protective sanitary and medical legislation, our profession must think and labor. The reform here suggested will require years of time, much patient and self-sacrificing effort, and no little expense, but no one who has given thought to the subject can question that the results to be secured are worth all of these. With a united profession we can easily guide legislation, State and national, into such channels as will accomplish most for ourselves and for our country, and at the same time give our great and noble profession that high place in the public estimation which, up to the present time, has been impossible because of defective organization and dissensions in our own ranks which are unworthy of us.

DISCUSSION.

Dr. JOSEPH M. MATHEWS, Louisville: I want to indorse this very excellent paper, but I must make one correction. The doctor's estimate of the attendance of the Louisville doctors at this meeting is entirely an erroneous one. Out of the fifteen hundred doctors we have in this city, I am sure, from personal observation, that there have been over a thousand

here in attendance off and on. When we met in Bowling Green several years ago, I think only two doctors attended out of two or three hundred.

There can be no question but what we need reorganization of the State Society. A few years ago it was my pleasure to sit at a banquet given by the State Society of Indiana. There were in attendance six hundred doctors. I think it is a disgrace that in this great State of Kentucky we open our convention with less than two hundred and fifty in attendance. Something is wrong, and I am inclined to believe with Dr. McCormack, that the petty jealousies that exist among our profession, both in the city as well as in the country, account for this condition of affairs. If we had had this organization of the medical profession of Kentucky within the last two years such quackery as osteopathy would not now be within our boundaries. I say this advisedly, because within the last five years we have succeeded in driving from this State every form of quackery except this last one, and we have every reason to believe that if the profession had stood shoulder to shoulder with the State Board of Health we would also have succeeded in banishing osteopathy. I would like to add, Mr. Chairman, that we have not yet given up the job, nor will we until the State no longer harbors any thing having the semblance of quackery.

Dr. W. W. RICHMOND, Clinton: I heartily indorse the paper read by Dr. McCormack. We all know the old adage, "In union there is strength." Some thirty-seven years ago I graduated from the University of Louisville, and the first duty I performed when I reached home was to join the Southwestern Kentucky Medical Society, and during the same year I joined this Society. I am positive that I have attended more than two thirds of the meetings of both societies. Twenty years ago I became a member of the American Medical Association, and am proud to say that I have attended most of those meetings. Whatever success I have attained in my profession I attribute largely to my connection with these organizations. About six months ago Dr. McCormack came to me and wanted to organize a county medical society, and I am proud to say that I am also a member of that society. I regard the Hickman County Medical Society as the most important society to which I belong. I believe that every doctor ought to join his county and State Society, and also become a member of the National Association.

Dr. DUDLEY S. REYNOLDS, Louisville: The great profession of medicine can be known through its organization only. The only way in which to maintain the dignity and high character of the profession of medicine in contradistinction to the arrant quackery which, I am sorry to say, is prevalent in a very large proportion of the States of the Union, is by organized effort. The American Medical Association is old enough, large enough, and strong enough to command the respect and the confidence of the intellectual work in America, Europe, and everywhere. The American Medical Association is a delegated body; it is made up of constituent elements, each State Society being a chief constituent, and it proposes in the imme-

diate future to recommend to the State Society that all its members should likewise be delegates from the county societies in that State. This is not a matter of sentiment, but of law, of authority; a matter that we are obliged to respect, and I felt it my duty to point out this fact to you.

Dr. CARL WEIDNER, Louisville: Dr. McCormack has presented a paper which offers much food for thought for every doctor in this country. I sanction every word of it. He has told us some very blunt truths, unpleasant though they were, and he has given us a very true picture, unfortunate as it is, of the doctor of the present time in his relation to every other doctor and to the laity.

I indorse every thing that the doctor has proposed with reference to the medical congress which is to be organized by the American Medical Association. I think the plan of concentrating the business power in the hands of a limited number of men is very feasible, providing they be chosen honestly and without medical politics.

I have been a medical teacher for fourteen years. I have seen the classes large and I have seen them small. The colleges in this State have done excellent work, but I believe, gentlemen, that the time has come when some thought must be given to the medical schools. In reading the Medical News a short time ago, I see that in the United States we have one doctor to less than 500 people. As medical men we are usually asked to guide the education of men entering our profession. I believe the time has come for the doctors, no matter whether it is to their interest or against it, to check medical aspirations on the part of the laity. I think we are beginning to be overcrowded, and with this overcrowding certain dangers present themselves to us. It is a well-known fact that there are many men in our profession to-day who merely eke out an existence, and are consequently tempted to do what is wrong. I think the medical colleges are taking the right step in regard to medical education. The standard is being constantly raised; but, gentlemen, we need money to do all this; we can not carry on a good medical education without having plenty of money, therefore let us have young men to study medicine who are well educated, and who, when they enter on their medical studies, can afford to pay for a good education. We owe it to ourselves and to the public to warn the young men from entering into the medical profession in excessive numbers. When our friends ask us about their sons, whether they ought to enter the medical profession, let us say to them that the profession is exceedingly overcrowded, and that their chances are consequently lessened. I hope that a general board of examination will be formed in this country, whose duty it shall be to pass on all candidates for entrance into our profession. Not until then will we have the proper standing.

Dr. AP MORGAN VANCE, Louisville: I feel that Dr. McCormack is on the right track. I am convinced that what he says is true. Some time ago I had a fellow-graduate of mine come to this city from the lower part of the State for the purpose of having his eyes treated. He was a man who stood

high in my class; in fact, he took the gold medal. I asked him whether he belonged to any medical societies, and he told me that he did not. I then said to him that I supposed he subscribed to a journal, and he said "no." I asked him what he did to keep abreast with the times. He said that whenever he got stuck he took down old Bell's lectures, and that he was guided by them.

One of the greatest fallacies of the present laws of this country is the fact that any doctor can be sued by any disreputable person in the community for any trumped-up charge without that person having to give a bond. If the doctor finally wins his case, he has to pay that fellow's costs. I can not see any justice in that. I want to sound a note of warning—*Beware of the lawyers.* Not a week passes but what some disreputable cuss, who has fallen off the street-car, comes to my office with a note from some of the most prominent lawyers in this city, as follows: "Dear Doctor Vance: Kindly examine this man, and let me know what you think of his case as to permanent injury." Don't you do it. Say to him that "if you will pay me for my services, I will examine your patient, but I will retain what I think about him until I am on the witness-stand." They won't have you then. They don't want the truth.

A short time ago my services were called for to testify in a railroad case. When the lawyers who had charge of the case heard that I had been called on to testify, they said that they did not want me because I would surely tell the truth. That is always the case. Frequently a young doctor will allow himself to be misled by the promises of financial gain, and by his testimony he usually does some other doctor some harm. We should impress this on our students at college, and warn them of the ways of the legal profession and sharp. Don't let them take you unawares, because they are never working in your interests; they are simply trying to use you.

Dr. C. C. GODSHAW, Louisville: I have listened very patiently to all the remarks in connection with this matter, and I trust that the opportunity will be given me to read a paper bearing on this subject. I fought a case of that kind in the courts of this State for seven years, but owing to a legal technicality I lost the case. Therefore, I say with Dr. Vance, beware of the lawyers. They will use you every time and give you nothing for it.

Dr. MCCORMACK (closing the discussion): It is extremely gratifying to me to have the members of this Society endorse my recommendations with so much cordiality. The paper was not written to tickle the ear, but to accomplish a definite and specific purpose, and it will fail of that purpose if I have not impressed each member present with the fact that it is his duty when he gets home to confer with his less fortunate fellow-members and take steps to organize a society in his county in order to remedy the evils which I referred to. I want to say to you now, that you might just as well proceed to organize, for if you do not do so, I expect to visit your county, no matter where it is, and I will get after you and keep at you until you have perfected an organization.

During the last two years I have visited forty-one counties in this State, and I do it in this way: I write a letter to each doctor in the county, telling him that I will be in the county court-room at a certain time, and invite him to meet me there. If I make the appointment in some doctor's office half the doctors will not go there, but the county court-house is common property, it is neutral ground, and I usually have no trouble in getting out a crowd. I talk to them a great deal more forcibly than I have to you who are the faithful few to go to societies. You will remember that the apostle always delivers his lecture to the faithful few who attend. I tell these doctors in the counties the plain, unvarnished truth. It is as bad in these country districts as it is here in Louisville. There are a lot of doctors right here in this city who do not subscribe to medical journals. There are a lot of excellent doctors here, and a whole large lot that need some missionary work. I know them all. This work can be accomplished, and I expect to devote a large part of the balance of my life to it I expect to visit the counties from time to time, and try to bring all the physicians together. I have often found when I have had these physicians brought together, and after I have talked to them, that a physician will get up and cross the hall and say to a man he had not spoken to for twelve or thirteen years, "Doctor, we have not talked for a good many years. Suppose we shake hands and make up."

Now, we have that condition of affairs all over Kentucky, right here in Louisville; in fact, Louisville is no better off than the country towns. There is less need for a county society in this county than in the outlying counties, but I expect some day to make an appointment in Louisville for the purpose of organizing a county society.

I want to appeal to you gentlemen to begin this work as soon as you get home, and unless you do so, I assure you that I will come and make a personal appeal to you in your own county.

SURGICAL EMERGENCIES FROM A MEDICO-LEGAL STANDPOINT: AN AUTHENTIC CASE.

C. C. GODSHAW, A. B., M. D.

LOUISVILLE.

The title of this paper, you will observe, is different from those usually read before medical societies.

We meet annually to help, aid, and instruct each other in various ways, and my object is to show how, upon a legal technicality, a large fee was deservedly earned, yet lost, in an emergency surgical case, in

the hope that, from my experience, you may gain a valuable lesson and govern yourselves accordingly. More particularly I desire to call the attention of the general practitioner to the fact and precedent established by the wise Solons of the law who have ruled in this case, that the foreman of a factory or corporation is only recognized as a special agent, employed for a specific purpose, and is not authorized by law to employ a surgeon in emergency cases and obligate his employer or the corporation for the services so rendered. Doctors, in general, are not business men, and I am satisfied the majority are blissfully ignorant of accepted and recognized legal facts. Therefore, it is very important to remember that a doctor, in bringing suit for collection of his just dues for faithful and skillful attention to employes of a factory or corporation, is not allowed to testify, if the debtor or appellee be dead, although the latter told me he would pay me, and, also, that no expense should be spared to save the life of the poor and unfortunate man, Schnable, whose case I shall briefly report, with criticisms from a medico-legal standpoint, and also read in full the opinion of the Court of Appeals of Kentucky bearing upon this suit.

You can easily see that the writer was put to no little expense, worry, and annoyance, and all I got for my trouble was a valuable lesson, some rich experience, and the immortal glory of having my name handed down to posterity as being the *first case* of its kind to be recorded in the legal proceedings of the State, and that a bad precedent in law has been established for the medical profession by sustaining the decision of the Jefferson Circuit Court, Law and Equity Division. It is but natural that I should be surprised at the treatment received, when, as an active practitioner for about twenty-five years, I want to emphasize the fact—this is the first time that I have failed to collect a fee when called to a factory or corporation in case of an accident, and it made no difference whether summoned by a subordinate employe, foreman, or general manager.

I shall now read in full the opinion of the Court of Appeals bearing upon this case, and shall take the privilege to criticize the same from a medico-legal standpoint, in the hope, if I err, it will be from a mistake of the head and not of the heart, as I have too much respect for the majesty of the law and the dignity of the Court. I desire to remind you, however, that my attorneys first attempted to get a trial before a jury in Judge Toney's court, who ruled us out on peremptory instructions, and, in giving his opinion, kindly and gracefully remarked upon

the value of the services rendered, and he believed the surgeon should be liberally remunerated. Thereupon an appeal was granted, and his decision ratified by Judge Burnam of the Court of Appeals.

Opinion of the Court by Judge Burnam, October 31, 1900:

This was an action by appellant against appellee to recover for his services as a physician rendered to a servant of appellee, who was injured while in their employ, at the instance of another of their employes. The facts, briefly stated, are as follows: The appellees, J. N. Struck & Bro., are a private corporation, doing business as carpenters and builders; the appellant, C. C. Godshaw, was, at the time of the institution of this suit, a practicing physician. In August, 1894, the appellees were engaged in doing the woodwork, by contract with Finzer Brothers, upon a building which was being erected for them under the supervision of an architect in the employ of the Finzers. A man named Raidt was the foreman of the carpenters in the employ of appellees in doing the woodwork on this building, and his duties as foreman were to superintend the workmen and see that the carpenters' work was done in accordance with the plans and specifications. He was not an officer or stockholder in the corporation, but was simply employed to boss appellee's part of the job in erecting the building. Jacob Hoertz, a brick contractor, was doing brick work upon the same building, upon the upper part of the wall, and a brick was knocked off of the scaffold and fell to the first floor, striking a man named Martin Schnabel, who was in the employe of appellee, on the top of the head and inflicting a very dangerous and severe wound, which rendered him temporarily unconscious. Thereupon Raidt, appellee's foreman, directed another of appellee's employes to call in the nearest physician, who got appellant; and upon his arrival at the building Raidt directed him to take charge of the case and give Schnabel every attention, and that J. N. Struck & Bro. would pay for it. It also appears that Raidt called at the home of Schnabel and told his wife that appellant would be in charge of the case and give her husband every attention that he required, and that J. N. Struck & Bro. would pay his bill. After this employment appellant took charge of the case, and treated Schnabel for several months. And this action is to recover $300, the alleged value of his services. No question is raised as to the seriousness of the injury to Schnabel, or of the necessity of immediate medical attention.

It is contended for appellant that the act of Raidt, the foreman of appellee, in employing appellant rendered them liable to pay the account sued on, as he acted in an emergency which required immediate medical skill to save the life of one of appellee's employes.

There is no testimony that Raidt had authority from appellees to employ appellant on behalf of the company, or of J. N. Struck, or that he was authorized to represent either of them in any capacity except as foreman of the gang of laborers employed in doing the woodwork on the Finzer building.

There is a marked distinction between the power and authority of a general and special agent to bind his principal. A general agent is usually authorized to do all acts connected with the business or employment in which he is engaged, while a special agent is only authorized to do specific acts in pursuance of particular instructions, or with restrictions necessarily implied from the act to be done; but in either case, if the agent exceeds the authority conferred, his acts will not bind the principal. Third parties dealing with an agent are put upon their guard by the very fact, and do so at their own risk. They can not rely upon the agent's assumption of authority, but are regarded as dealing with the power before them, and they must, at their peril, observe that the act done by the agent is legally identified with the act authorized by the power. See A. & E. Encyclopedia of Law, 986, and authorities there cited.

Appellant admits this general rule of law, but insists that it does not apply in cases of emergency which require the immediate procuring of medical skill to save human life or prevent great bodily injury, and to support this contention refers us to a number of cases decided by courts of other States which relate to the employment of a surgeon by some officer of a railroad to administer to an injured employe or passenger in certain cases by reason of special circumstances, namely:

In the case of the Louisville, New Albany & Chicago Railroad Company v. Smith, 22 Northeastern, 775, a brakeman in the employ of the railroad company was seriously injured while engaged in the discharge of his duties, and the conductor employed a surgeon to take charge of and treat the unfortunate. The court held that in a case of an emergency of this kind the conductor, although an agent inferior to the general superintendent, had the power to employ surgical aid, basing its decision upon various cases of the kind in other States.

In the case of the Terre Haute & Indianapolis Railroad Company v. McMurry, 98 Ind. 358, a brakeman was injured while in the discharge of his duties, and the plaintiff was requested to take charge of the case by the conductor. The court, in passing upon his claim, used the following language:

"In ordinary cases the conductor or other subordinate agent has no authority to employ surgical assistance for a servant of the corporation who received injuries or became ill. We do not doubt that the general rule is that a conductor has no authority to make contracts with surgeons, and if this principle governed all cases, the discussion is at an end; but we do not think that it does rule every case, for there may be cases so strongly marked as to constitute a class within themselves and be governed by a different rule.

"An emergency may arise which will require the corporation to act instantly, and if the conductor is the only agent and the emergency is urgent, he must act for the corporation; and if he acts at all, his acts are of just as much force as those of the highest officer of the corporation."

Our attention has been called to other cases in which the same prin-

ciple contended for has been applied in the case of railroads, but the distinction between the liability of a railroad corporation and other manufacturing and private corporations for services of the character sued for here, and the reasons therefor, are very forcibly stated in Chaplin v. Vreeland, 7 Ind. App. Court Rep. 678–9. In this case the court said:

"Railroad companies occupy a peculiar position with reference to such matters; exercising quasi-public functions, clothed with extraordinary privileges, carrying their employes necessarily to places remote from their home, subjecting them to unusual hazards and dangers, the law has, by reason of the dictates of humanity and the necessities of the occasion, imposed upon such companies the duty of providing for the immediate and essential needs of injured employes when there is a pressing emergency calling for their immediate action. In such cases even subordinate officers are sometimes, for the time being, clothed with the powers of the corporation itself for the purposes of immediate emergency, and no longer."

It is also a matter of common knowledge that railroad companies habitually and regularly employ surgeons and physicians in connection with the conduct of their roads. But we have been referred to no cases where it has been held to be within the duties of the manager of a factory, for either an individual or corporation, to employ physicians or surgeons for employes.

We are not, therefore, prepared to hold, as a matter of law, that the employment of physicians or surgeons for injured employes comes within the scope of the duties of a general manager of an ordinary manufacturing business. It seems to us that the rule that appellant seeks to have applied to his case is confined exclusively to railroad companies, and generally in cases which involve some act of negligence on the part of the company which occasioned the injury.

Appellant has cited several cases where it was sought to hold manufacturing companies liable on the same principle, but in each of these cases the employment of the surgeon was made by the general business manager of the company, or the general superintendent of the company, and we think that the present case can not be brought within the rule laid down in any of these cases.

In the first place, the services sued for were not confined to the immediate emergency, but lasted during a period of several months. Appellees, in the mean time, resided in the same city and only a short distance from where appellant lived, and it would have been very easy for him to have inquired as to the alleged authority of their foreman, Raidt, to act for them.

Usually an injured employe procures and pays for his own doctor, and if his employer can be made liable for his injuries, he recovers this sum with other damages. In this case no necessity is shown why appellee should have selected the physician to treat the injured man during the long period of his confinement, as it does not appear that he lacked friends or relatives, who were both willing and able to do so for him.

It is also contended that even if it be conceded that under the testimony

in this case appellee's foreman did an unauthorized act, which was not binding upon his employers, that there is sufficient evidence in the record tending to ratify the act of the foreman to have entitled the appellant to have the question of ratification submitted to the jury.

There is no testimony to show that appellee ever knew or heard of the alleged employment of appellant by Raidt, and it consequently follows that there can be no question of ratification of such act. But even if it be conceded that they did know of such employment, we are of the opinion that the conversations between them, witness Hoertz, and Struck clearly rebut any idea of such ratification. We, therefore, conclude that appellee was primarily under no legal obligation to secure medical attention for Schnabel, and that their foreman had no authority, express or implied, to make any contract in reference thereto which would be binding upon them, and that if he made such a contract, there was never any ratification thereof by appellee so as to make them liable on the account sued on.

For reasons indicated, the judgment is affirmed.

Now, you have heard me read the learned opinion of the Court of Appeals, and it seems to me it is but just and fair to the medical profession and to me, as appellant, as I was not permitted to testify in some respects in my own behalf—owing to the death of the appellee—that you know my material side of this case, which I publicly affirm to be the truth.

In giving my testimony before Judge Toney, I was not permitted to repeat the conversation that passed between the appellee and his verbal contract to pay me, all of which occurred in front of his residence on the second evening following the accident to this man, Schnabel. He made the same statement again shortly before his death, and this conversation took place in the office of his planing-mill, when he added that if Schnabel did not appeal his suit, he would pay me and make Finzers and Hoertz give their share. Those were his words. The appellee was cognizant of the fact that Dr. A. M. Cartledge was in this case with me later on. at my suggestion and request; assistance was needed, and the appellee was satisfied. Then, again, John Dillman, the father-in-law of Schnabel, was not permitted to testify to the conversation that passed between him and the appellee, J. N. Struck, when the latter told him on the premises of Schnabel, as he started to the drug store, that "he would pay all expenses" to save the life of the injured man. Even Mr. Hoertz testified that the appellee had told him he would pay as I have stated, but, owing to Schnabel's suit and my strong testimony in that case,

that he changed his mind. Yet my last conversation occurred long subsequent to Schnabel's trial and shortly before the death of the appellee.

To make this matter clearer, it may not be uninteresting to briefly report that Schnabel brought suit in the Common Pleas Court for heavy damages against J. N. Struck, Bro. & Co., the Finzer Tobacco Co., and Jacob Hoertz, the brick contractor. The trial took place, I think, in 1896, about two years after the accident, but Schnabel lost out on the ground of contributory negligence, which means that he disregarded the warning danger-signal placed there by the brick contractor, and the jury held that he was to blame for his terrible misfortune, and brought in a verdict for the defendants.

Now, my bill was never rendered against Schnabel, yet in giving my testimony in his trial, as attending surgeon, I am satisfied at the time the defendants were somewhat displeased, as I have already shown. What would any of you do under the circumstances? I did in his suit my honest and conscientious duty and told the truth. He had an extensive scalp wound, with a large fracture of the skull, requiring the removal of foreign bodies and necrosed bone. Schnabel did not take an appeal, and I affirm but for the death of Mr. J. N. Struck this paper would not have been read before this Society, as my bill would have been paid by him.

Judge Burnam, of the Court of Appeals of this State, in his opinion, has suggested a prophylactic remedy in similar cases of emergency surgery. He says: "Third parties dealing with an agent are put upon their guard by the very fact and do so at their own peril." He would that we have the proper authority obligate himself in writing, so that in case of death there can be no legal dispute as to the validity of the debt. You can, therefore, see how even the lips of the foreman, Raidt, were sealed, as he was not permitted to testify. There was no question raised as to the seriousness of the injury to Schnabel or of the necessity of immediate medical attention. The monetary value of the services was proven and admitted by the testimony of Drs. Cartledge and Vance. I have studied the opinion of the Court of Appeals carefully, and must confess that, while through the death of Mr. J. N. Struck I am the loser, yet the law in such cases is a wise one, and is made for protection against fraud. I can, therefore, see how the Court of Appeals, that was not cognizant of the fact that J. N. Struck was dead at the time of the trial, could say: "There is no testimony that

Raidt had authority from appellees to employ appellant on behalf of the company or of J. N. Struck, or that he was authorized to represent either of them in any capacity, except as foreman of the gang of laborers employed in doing the work on the Finzer building." After a careful analysis of this opinion, it is, indeed, a puzzle to me how the learned judge could base its decision partly upon the conversations between the witness, Hoertz, and Struck, and draw this line of demarkation as to testimony, when it is presumed he knew nothing of the conversations that took place between Struck and the appellant or Dillman, and, possibly, Raidt.

My lips were sealed, as well as those of my witnesses, and an adverse opinion was to be expected because, unfortunately, we could produce "no testimony to show that appellee ever knew or heard of the alleged employment of appellant by Raidt, and it consequently follows that there can be no question of ratification of such act." It is conceded that Raidt, the foreman, was humane enough to employ immediate surgical aid, go in the ambulance with the patient, Schnabel, to his home, and tell the family he was instructed to look after him, and that J. N. Struck & Bro. would pay all expenses. Surely Raidt did not go there uninstructed, and it is but fair to presume that he at once reported to his firm the nature and facts of the accident to an employe. It stands to reason and common sense that no foreman with the least spark of humanity and fellow-feeling in his breast could be so inhuman and despicable as to deceive a poor, distressed, and afflicted family by false pretenses when he had nothing to gain by it. Grant, for argument's sake, that a foreman has legally no right to bind his corporation, yet from my knowledge of and connection with this case I have a right to believe that Raidt, the foreman, told the truth, and furthermore, Mr. J. N. Struck, deceased, would endorse and ratify all he (Raidt) said, as well as the other testimony I have mentioned, were he alive to-day. I desire most respectfully to call the attention of the Court of Appeals to the fact, of which no doubt he had no knowledge, that I did just as he writes when he says: "The appellee, in the mean time, resided in the same city and only a short distance from where appellant lived, and it would have been very easy for him to have inquired as to the alleged authority of their foreman, Raidt, to act for them." But I was not permitted to testify to this effect, owing to the death of the appellee.

This is an object-lesson to the profession at large, and the ques-

tion naturally arises: What shall the doctor do in similar cases? Let us, without sentiment, look this question squarely in the face and consider it seriously. Can we be true humanitarians and at the same time strict business men in cases of emergencies? Must we, in such trying times of trial and need, before relieving the injured and, perhaps, save human life, ask who is going to pay for our outlay of material, time, and knowledge?

We have been told that "third parties dealing with an agent are put upon their own guard by the very fact, and do so at their own risk." No true physician (and the laity would rightly condemn him for such inhuman conduct) would demand protection from the first party of a factory or corporation when his services are immediately needed. Surely the learned Judge Burnam must be mistaken when he says, "Usually an injured employe procures and pays for his own doctor." It has been my experience, when immediate surgical or medical attention is required for an employe hurt in a factory, corporation or construction of a building or what not, that usually the nearest doctor is at once sent for or some doctor whose services must be sought by the parties indemnified by accident insurance. In this case there was an immediate emergency, and the poor, unfortunate laborer did not employ the appellant, and I know as an undisputed fact he was financially unable to pay for the services rendered. Again, it is now a very common and proper thing for a factory or corporation to carry indemnity insurance for self-protection against suits upon the part of injured employes, and it therefore seems to me that it "does come within the scope of the duties of a general manager of an ordinary manufacturing business" to employ medical and surgical aid as well as railroad companies. The dictates of humanity cry out just as loudly to one business concern as the other, and the advances on the broad road of enlightenment and civilization are being encouraged and recognized by the human heart. There is, in this respect, to my mind, no difference between a "foreman of a gang of laborers," who bosses and superintends the carpenters in the construction of a large plant, and a conductor on a railway, who bosses his gang of hands and superintends a train of cars loaded with passengers or freight. Therefore, I maintain that since in both cases there is a question of immediate necessity, why should not the doctor be paid for his labor? It is a blessed act of humanity now that factories and corporations, as well as railroads, look after the immediate emergencies of their employes and

endorse and ratify the action of one employe toward another in case of accident. In fact, the names of physicians, so-called contract doctors, are posted in different parts of a building where hands are at work, and any employe is expected to summon a doctor in immediate emergencies at once. The accident indemnity company is then notified, through the proper authorities, and thus the surgeon is protected, or at least he should protect his own interests.

The good doctor is a true humanitarian. He is faithful to his calling, loving his profession for humanity's sake, and responds quickly, without hesitation, to the cries of suffering and distress, to relieve the injured and oftentimes save human life. Can he, therefore, under such surroundings and conditions, stop to barter, trade or make a contract? The medical profession and humanity are synonymous terms, and yet how often is the doctor imposed upon! To me, in emergency surgery, the word of the proper authority is all-sufficient, yet why should not the doctor also be a business man? Would a contractor, builder or manufacturer consider himself safe and protected without a written contract? Shall the doctor do likewise? This is a hard question for me to answer, and I hold that the conscience of a good and true physician must be his guide of action in the discharge of duty to a fellow-sufferer.

I close this paper without any bad feeling or unkindness to all parties concerned. I am happy in the consciousness of duty well performed, and the consolation of having saved the life of a fellow-being, a poor, common laborer, and thereby prevented a widow and many innocent orphans from ekeing out a more miserable existence. Let us hope in the future it will not be necessary to combine business with duty, but when summoned to respond to the call of distress and suffering in emergency cases the doctor will not alone be recognized as a humanitarian, but treated in accordance with the Golden Rule in the fullest sense of its meaning, and, above all, that the moral law more than the legal code shall be the rule of action between the employer or corporation and doctor in any and all cases of emergency surgery. I came, I saw, but I was conquered by the majesty of the law, yet I shall always maintain that, if not legally then morally, the debt is just and unpaid, and be it said to the sacred memory of my friend, Mr. J. N. Struck, deceased, I am satisfied beyond the question of a doubt my claim would have been paid and all unpleasant litigation avoided had he lived.

We have been taught to believe that He who rules the destinies of

nations is alone infallible and is the Supreme Judge of the universe. While we do not question the honesty and sincerity of the judges whose opinion in this case has become a law, yet might they not be in the wrong, as it is human for the best of men to err?

It is a recognized fact that the medical profession is a great friend of charity and philanthropy. When a doctor does charity practice it is true charity, but when he works for pay he naturally expects to be paid, as I did in this case. Therefore, reasoning from the standpoint of the doctor, it does not look fair and just if this law shall forever hold good and incontestable.

THE PRACTICAL MANAGEMENT OF SMALLPOX.

M. K. ALLEN, M. D.

LOUISVILLE.

Directly after the return of the soldiers from the Cuban war to the United States there commenced one of the most widespread epidemics of smallpox this country has ever experienced. This epidemic has entailed a cost to the people of this country of millions of dollars in the way of vaccination, isolation, and the caring for those afflicted with the disease, and millions of dollars in the loss sustained to business, not to speak of the loss in life.

The disease has prevailed in a mild form, and the death-rate has been low. Many counties in this State have had to contend with the disease, and, aside from loss of life, the direct pecuniary loss has been over a quarter of a million dollars, to say nothing of the business loss and embarrassment.

It has therefore occurred to me that it might not be uninteresting to at least some members of this Society to give a short, concise statement of the methods which have been employed by the health department of this city during the past two or three years in the management of smallpox.

At the suggestion of the health officer, an ordinance was adopted and became effective February 6, 1899, Section 11 of which reads:

"It shall be the duty of all inhabitants of the city of Louisville, who have not been vaccinated, or, if vaccinated, not successfully, to procure their own vaccination, or revaccination, as the case may be,

within ten days from the passage of this ordinance; and all persons who shall fail or refuse to comply with this section of the ordinance within the time prescribed herein, or shall fail or refuse, on demand of the health officer, to submit to vaccination by him or by the physician of the eastern or western districts, or some other reputable physician of the city of Louisville, shall be fined in any sum, not less than five dollars nor more than fifty dollars for each offense."

Section 12 of the same ordinance reads: "No principal of any school and no principal or teacher of any private, sectarian, parochial, or other school shall admit to any school any child or minor who shall not have been properly vaccinated. The evidence of such vaccination shall be a certificate signed by the health officer or any practicing physician."

Section 13, same ordinance, reads: "The health officer is hereby empowered to visit any and all public, private, and parochial schools in the city, and to make or cause to be made an examination of the children and minors in attendance therein as often as may be deemed necessary to secure compliance with the provisions of this ordinance."

It will thus be seen that the health officer of this city is clothed with full authority to compel vaccination, and this discretionary power is exercised without fear or favor. I am glad to be able to say that meanwhile the more intelligent part of our community voluntarily seek vaccination. The enforcement of the ordinance in reference to the public schools is done in a very thorough and systematic manner.

It is the custom of the health officer to confer with the superintendent of the public schools in the months of October and February of each school year, which results in the principals requiring teachers to report to the superintendent the number of unvaccinated children applying for admission to the various schools in the city.

When the superintendent has acquired this information, he in turn notifies the health officer of the exact number of children to be vaccinated. A program is then arranged by the superintendent of schools and the health officer whereby the principal of each school is notified of the day and hour when a physician from the health department will be present for the purpose of vaccination. The pupils to be vaccinated are in turn notified to present themselves with perfectly clean arms at the time appointed to receive the operation of vaccination.

By a strict adherence to the program as outlined, the entire unvaccinated public school population are reached within a week or ten

days, twice in each year, and oftener if thought advisable. Being governed by the reasonable desire for the protection which vaccination affords, many of our more intelligent people who employ help, acting upon the advice of the health officer, require evidence of successful vaccination as one of the conditions of employment. We use both points and hermetically-sealed glycerinated glass tubes, rather preferring the tubes, as our experience leads us to believe that there is less inflammatory action ensuing.

In our hands most marvelous results have been obtained, at least ninety per cent of primary vaccinations proving successful, if the operation is done after the following fashion:

Site. The insertion of the deltoid in the left arm is to be preferred in children who are old enough to walk, and in adults. The outer side of the thigh below the junction of the lower and middle thirds may be chosen in women and infants, sometimes also the junction of the middle and upper third of the leg on the outer side.

Asepsis. The hands of the operator had best be thoroughly scrubbed with soap and water before undertaking this little operation. The point of vaccination should be thoroughly washed with a brush and soap, then with plain water, and lastly with alcohol on a piece of sterile gauze or cotton, allowing the alcohol to evaporate.

Scarification. Scrape at least two surfaces not over three-eighths inch each in diameter, sufficiently to bring a little blood or serum. An ordinary cambric needle is the best scarifier, and this should be passed through a flame before using.

Virus. Use preferably glycerinized virus; rub it thoroughly into the scarified area with a small piece of wood which has been previously boiled. Allow the part to dry in the air; no dressing is necessary.

I have dwelt upon this feature of this paper, because vaccination is not only an absolute preventive against the inception of smallpox, but, should the disease by any means get a foothold, vaccination and revaccination will rapidly and surely eradicate it.

The truth about the matter is, that the time has come when failure on the part of any community to gratuitously, regularly, and systematically practice vaccination as a prophylactic measure is as criminal as it would be on the part of a practicing physician to neglect the use of antitoxine in diphtheria, mercury and iodine in the treatment of syphilis, quinine in the treatment of malaria, salicylates in the treatment of rheumatism, or atropin in the treatment of opium poisoning.

So much for vaccination. We will now hurriedly refer to our practice in reference to isolation. The health officer recommended the following, which became a law in this city February 6, 1899: "That any person who shall have the smallpox and refuse, on the demand of the health officer, to be sent or to be taken to the Eruptive Hospital, or to remain at said hospital, after being sent or taken thereto, during his or her illness from said disease or before being discharged therefrom by its superintendent, shall be fined not less than twenty-five dollars, nor more than one hundred dollars, for each offense."

It will be observed that the health officer has absolute authority to compel isolation by having all persons conveyed to the Eruptive Hospital, which is situated at least five miles from the city on a large tract of land which belongs to the city. Since I have had the honor to be health officer of this city, we have had six hundred and sixty-one cases of smallpox, and that you may know how I have exercised my authority in this direction, I report the fact that out of this number all were sent to the Eruptive Hospital, and thus put in complete isolation, with the exception of nine persons, and they were in such physical condition that their lives would have been endangered by removal, and I will say that three did die within forty-eight hours.

When a suspected case of smallpox is reported to the health department by a physician or otherwise, one of the physicians connected with the office, who is experienced in the diagnosis of this disease, visits the suspected case, and if found to be suffering from smallpox, the ambulance is immediately telephoned for, and the patient is removed to the Eruptive Hospital. The physician then vaccinates the immediate neighborhood. The next step is to send an inspector from the health office who knows his business, and all the old bedding and woolen fabrics in the infected house are saturated with coal oil and cremated, the city remunerating the owners of the property thus destroyed.

The infected house is then tightly closed and fumigated with formaldehyde gas. We use the H. K. Mulford regenerator and a forty-percent solution of formalin. Health departments all over the country after having tried all known means of disinfection have almost unanimously concluded that formaldehyde is the most destructive agent to germ life now known, and our own personal experience fully justifies this almost universal opinion. I am enabled to say that in almost every instance, when cremation and formaldehyde disinfection

for a period of from four to six hours has been practiced, we have not had a recurrence of smallpox.

While formaldehyde gas is a destroyer of odors, it has scarcely any odor itself, and it does not attack metals, as does sulphur and other substances which are sometimes used for disinfection. In the use of this agent for the destruction of germ life it is necessary to first close the windows, doors, and other openings of the room or rooms to be disinfected as tightly as possible with folds of paper, wet batting, or old cloths. Bed clothes, carpets, and other fabrics should be lightly spread over chairs and bedsteads. The amount of formaldehyde to be used in any given space can be obtained by multiplying together the length, breadth, and height of the room or rooms, and then allow from eight to twelve ounces of forty-per-cent solution of formaldehyde to each one thousand cubic feet of room space to be disinfected.

It will be thus seen that it would require thirty fluidounces of formaldehyde to properly disinfect a room 15 x 20, with a ceiling 10 feet high. This amount of formaldehyde will be evaporated in about forty minutes. The space thus treated should be kept closed from six to twenty-four hours.

There has recently been placed upon the market a para-formaldehyde candle, put up in two sizes, which can be used as are the candles of sulphur dioxide. These candles consist of para-formaldehyde incorporated with a small proportion of paraffine and pressed in cylindrical form.

These candles are supplied in a tin container or burner, to which a limited amount of oxygen has access during operation, so as to support combustion only at the bottom of the candle, and by burning in this manner the heat produced causes the solid para-formaldehyde to revert to the gaseous formaldehyde.

The smaller of these candles contain three hundred and fifty grains each, and when ignited generate sufficient gas for the surface disinfection of a room not exceeding three hundred cubic feet capacity, and by increasing the number of candles, in the proportion of one candle to every additional three hundred cubic feet of air space, any size room can be disinfected. The larger candles, containing seven hundred grains of paraform, are useful in disinfecting larger spaces, such as halls, churches, and school-houses.

Exhaustive tests have been made by the bureau of bacteriology of the health department of the city of Buffalo, N. Y., as to the destructive

efficiency of these candles. These experiments have fully developed the fact that all pathogenic microbes and spores are energetically destroyed, without exception, by their proper use.

It should be remembered that formaldehyde gas disinfection can not be positively relied on so far as glazed surfaces, such as china, marble, metal, etc., are concerned, and that subsequent washing of these surfaces should be practiced with a solution possessing such recognized properties as a five-per-cent solution of formalin, carbolic acid, or some other disinfecting solution possessing solvent and penetrating germicidal powers.

I will say for the information of any one who may wish to try these candles for disinfecting purposes in any character of contagious diseases, he can be put in communication with the State agent by communicating with the health department of this city.

Now, to sum up the suggestions contained in this paper, which is already too lengthy, I will say that vaccination and revaccination promises absolute immunity against variola, one of the most disgusting diseases with which the human family have to contend. Secondly, that perfect isolation completely checks the spread of variola, and thirdly, that disinfection properly performed with formaldehyde gas does, beyond any reasonable doubt, destroy bacterial life. If these three methods as suggested will accomplish what is not only claimed in this paper, but confirmed by the experience of the whole world and admitted by all intelligence, both professional and otherwise, why should smallpox prevail in any community? And are not those in official authority morally responsible for not providing the proper means to prevent sickness and death from such a disgusting and loathsome disease as is smallpox?

EMPYEMA OF THE ANTRUM OF HIGHMORE.

M. F. COOMES, A. M., M. D.
LOUISVILLE.

Abscess of the antrum of Highmore is most frequently produced by the roots of the teeth which project up into the cavity. Abscesses in this locality may result from a growth of any kind that exists in the cavity, and may also be produced by disease extending from the nose into this space. The thing that concerns the practitioner and

surgeon most is the general management of such cases. Many ways have been suggested as to the manner of draining this cavity, which is the desideratum, and, in fact, necessary to effect a cure. One class of surgeons propose to make an opening through the alveolus and insert a drainage-tube. This sounds very well, and works well for a while, inasmuch as it satisfies the patient, because the cavity can be cleaned every day with little or no trouble. I say cleaned; this term should be modified, because where drainage-tubes are inserted it is absolutely impossible to keep the cavity thoroughly cleaned, for the reason that if it projects above the floor of the antrum it will not drain the cavity as it should. If it does not reach the level of the floor of the antrum, and even if it should reach to the level of the floor, granulations will sooner or later close the tube, and you have the same conditions as if the cavity were closed from any other cause. Further, it should be remembered that the floor of an antrum is not so constructed as to be able to drain it from any particular point. It has been demonstrated by actual dissection that the floor of almost every antrum is more or less irregular, and in many instances divided into two or more compartments by bony partitions springing up from the floor and extending from side to side. Again, the floor is rarely level; in fact, it is nearly always inclined to one side or the other, or it may have a very decided depression in its center. Any one of these conditions will, of necessity, make it difficult to thoroughly drain the cavity.

With these anatomical facts before us in connection with the cavity of the antrum, it is quite clear that the manner of draining this space is not the same in all cases. For instance, suppose that the floor of the antrum should be divided into two equal compartments by a partition extending from one side to the other, an opening made into one of these compartments would result in simply draining that compartment, while the other would be left in a foul condition; hence it will be seen that although an opening is made into the floor of the antrum, it may not result in enabling us to thoroughly cleanse the cavity. Before going further it is well to consider the locality in which the antrum is to be entered. If the patient should have a full set of teeth, in good order, it is very desirable to retain them, hence the canine fossa would probably be the best place to enter the antrum. If this position is not desirable for any cause, it will be left to the surgeon's judgment as to what point it is better to enter the cavity.

As many as 70 per cent of all cases of abscesses of the antrum are due to carious teeth. In the majority of instances we are warranted in removing the diseased teeth or tooth and entering the antral cavity through the channel occupied by the tooth. Just here I wish to state that the great fault with many surgeons is that they fail to make the opening sufficiently large. I am sure that I have been guilty of this in my earlier professional life, but of late years the necessity of thorough drainage has been so impressed upon me that I have invariably made larger openings into the antrum, quite large enough to insert the largest size eustachian catheter. I have frequently had dentists to make this opening by using a dental engine, and one of the difficulties I have met with is to get them to use a burr sufficiently large to admit of thorough drainage.

Kyle, one of the modern, up-to-date surgeons, in his recent work on this subject advises making an opening large enough to admit of packing the cavity with gauze, and in this way drain the cavity. I am sure he is quite correct in this, as his statements are borne out by clinical facts, and those who have practiced his methods and witnessed the failure of other methods can bear testimony to the good results thus attained. Kyle says that "as to the question of a drainage-tube in the antrum from below, my own experience has been that not one that I have used is entirely satisfactory." I am sure he is correct in this particular. Sometimes cases do get well where the tube is used, but it must be remembered that in some of these cases the cure is spontaneous; that nature provides a remedy, and the diseased condition passes away after a certain period. No doubt nature has provided a means of drainage through the nasal cavity in these cases, and just here I may say that very many cases of ozena are the result of abscesses in the antral cavity, the pus from that cavity flowing into the nose and giving rise to the unpleasant odor. It is very natural that this cavity, when once infected, would be slow to recover, the chief reason being that its interior is a secreting surface, and other accessory cavities pour their secretions, either directly or indirectly, into this cavity. Further, it must be remembered that this cavity is kept at a high temperature, a temperature which is sufficient to produce decomposition of the secretions that are in the cavity. To recapitulate, the main difficulties to contend with in effecting a cure of empyema of the antrum of Highmore is the difficulty of effecting and maintaining thorough drainage, and the readiness with which the secretions become

decomposed in this cavity, and the difficulty of thoroughly washing out the cavity.

To overcome these difficulties, free drainage of the cavity by making an opening sufficiently large to permit of thorough cleansing, and the application of such medicated agents as will best suppress and eradicate the disease, for this is the object that is desirable to accomplish in all cases. The use of drainage-tube is the equivalent of admitting that such cases are incurable, and I believe that it is not the wish of any patient so afflicted to maintain a constant nuisance, which they are sure to do if they retain the tube leading into the antrum.

DISCUSSION.

Dr. R. C. McChord, Lebanon: This is a very interesting subject, and is exceedingly well presented by the writer. I presume that all surgeons recognize the necessity of drainage in these cases. This can only be obtained by cutting up through the canine fossa, making a free opening, and, if necessary, curetting away all septic material and establishing a free drainage. I do not believe that a rubber or glass drainage-tube provides the necessary drainage; I think gauze is to be preferred. After having thoroughly cleansed the antrum it is an easy matter to put in a piece of gauze drain, and maintain drainage in that way.

The objection to the drainage-tube is that we are extremely liable to get septic material into the antrum, even if we render that cavity sterile to a certain extent by our injections and washing out. It is liable to become reinfected from the mouth through the drainage-tube. With a gauze drain this can, to a certain extent, be obviated, as the gauze can be easily replaced without interfering with efficient drainage. I believe the proper drainage in these cases is through the mouth, but I would insist that the opening should be large and free of access. It gives the patient less trouble in cleaning it out, and less trouble when packing the antrum with gauze.

Dr. J. M. Ray, Louisville: This subject is an exceedingly interesting and important one, and I am very sorry that I did not hear all of the doctor's paper, because I would like to know what his ideas are with reference to the etiology of diseases of the maxillary sinus; first, something about the relation, if any, of diseased teeth to disease of the maxillary sinus. When we first recognized these cases a few years ago it was the accepted teaching that a great many of them were due to diseased teeth, but the more I see of these cases of empyema of the antrum the more do I become convinced that a very small per cent of the cases are the result of diseases of the teeth.

During the past winter many of us have seen an enormous number of cases of acute empyema; in fact, in this city it was at one time the fashion-

able disease, almost an epidemic. It was complicated with grippe. A few of them had some swelling, but in all of them there was much pain about the jaw and extending to the inner canthus and over the side of the head. The majority of them got well on the expectant plan of treatment, and others persisted until some surgical interference was made. The diagnosis was usually made with ease, either by looking into the nose and seeing a small amount of pus in the location of the hiatus or by resorting to transillumination. Some recovered with hot applications locally, and in others the antrum had to be opened. In those cases we passed a small trocar and canula into the antrum by penetrating the inner wall; a syringe was then attached to the canula and the antrum very freely washed out. Two or three aspirations of this kind usually brought relief and the cessation of the pus discharge.

When we come to the chronic treatment a different proposition presents itself to us. I believe that in chronic empyema of the maxillary sinus the mucous lining of the antrum is converted into a pyogenic membrane. It is utterly impossible to have it get well unless we remove that membrane. The treatment of the antrum must be prolonged. It is a fruitful source for the development of polypi and granulation. I have removed a great many of them. It is impossible to deal with this condition satisfactorily by simply pulling out a canine or wisdom tooth, washing out the antrum through that opening. The trocar and canula is much the better method of treatment. During last summer I had an opportunity of seeing some very radical work in Berlin. They would make an incision through the whole upper lip, removing the entire anterior wall of the maxillary sinus, and then tear out the periosteum throughout the entire cavity, leaving the bone bare. After a month or six weeks a skin-graft would be put into this cavity, and all the cases which I saw recovered beautifully.

Dr. J. G. CARPENTER, Stanford: If you will make an exploratory incision into the antrum with the DeVillbus saw an osteoplastic operation can be performed in about three minutes. You can remove the pieces of bone and replace them. I think everybody who is doing this kind of work should have this outfit.

Dr. S. G. DABNEY, Louisville: The doctor's paper was a very interesting one, but in the first place I think his theories as to the etiology and causation of this disease are somewhat different from those held by most of us at the present time. My experience concurs more with that of Dr. Ray, and is a little more in keeping with most writers on this subject. I do not believe that Dr. Kyle's statements in regard to the etiology will be borne out.

I think transillumination is of great value in the diagnosis of this condition; I think that it often fails because the room in which it is used is not sufficiently dark. I do all my nose and throat work in a perfectly dark room, and I rarely find a case of empyema of the antrum where the light does not show some cloudiness on the affected side.

In regard to the acute cases, we have all seen them this spring. I saw them in a number of children, an experience which was new to me. I had one child of six and one of eight years of age, both having antrum disease. In one of them the pus ran back into the middle ear, exciting an acute inflammation. My own experience is that they do not need any operation. I have seen quite a number of cases, and can not recall any that did not recover by thorough cleanliness of the nose; cleaning it out several times a day, so that the antrum could empty itself into the nose. I usually apply hot applications and a compress, and I think it is a very small proportion that will not recover under that treatment.

I think the best place of opening is in the alveolar process, and the opening should be large. Of course, sometimes it is a pity to sacrifice a sound tooth, and when they are all sound we may make our point of election elsewhere, although the drainage will not be so good. I had an instructive case a few years ago where the opening had been made through the alveolar process. A piece of gauze had been forced through the opening, and, by an accident, it was forced into the antrum. The patient came back complaining of considerable pain from pressure, and in order to remove the gauze I made the opening about four times as large as it had been. As a consequence the patient got along much better than before, thus emphasizing the importance of a very large opening to permit of free drainage.

I do not believe that the drainage-tube is of any consequence, as it does not provide constant drainage. I think the radical treatment described by Dr. Ray would hardly be acceptable to most of our private patients. I think that very few of them would submit to such radical measures for the relief of even an empyema of the antrum.

Dr. DUDLEY S. REYNOLDS, Louisville: I have listened attentively to Dr. Coomes' paper, and I gather that his whole purpose is to emphasize the necessity of free drainage in abscesses of the antrum. Nothing in relation to acute cases, nothing in relation to etiology, and nothing in relation to any other point except the question of drainage. He did not even tell us with what fluids he washed out the antral cavity. The question of drainage is what he emphasizes.

I do not approve of opening the antrum through the alveolar process. If you examine a great many cases you will find that in the large majority of them a dental ridge rises up near the center of the maxillary sinus, and these grooves are on the other side. For drainage you should have openings in dependent places, and, of course, that would not be convenient. The anterior boundaries of the canine fossa are the choice situations for opening the antrum of Highmore. I think the opening should be about the size of a one-fourth inch drill. If that does not answer, or if I find polypoid growths within, I set the drill immediately behind the first opening and enlarge it posteriorly. In that way an opening is easily made large enough to take out any polypoid growth. I am quite sure that ulti-

mate recovery will be found to be accompanied by fewer complications than when the opening is made through the alveolar process.

Dr. COOMBS (closing the discussion): Dr. Reynolds grasped the full intent of my paper. I simply emphasize the importance of free drainage, without mentioning that any particular cleansing agent is necessary, because every surgeon has some favorite antiseptic solution which he knows how to use. I thought the best thing to do was to make plain and clear the necessity of drainage. I believe that permanganate of potash and Laboraque's solution are the best. Frequently a solution of common salt, with a little permanganate added, answers every purpose. All our efforts and procedures will prove ineffectual if we do not have a sufficiently large opening, which will permit of proper cleansing and drainage.

THE LONGEVITY OF PEOPLE OF SEVENTY YEARS AND OVER LIVING IN THE VALLEY BELOW THE CITY OF LOUISVILLE, CALLED THE PONDS SETTLEMENT, WITHIN THE LAST HALF-CENTURY.

T. B. GREENLEY, M. D.

MEADOW LAWN.

The writer commenced the practice of medicine in this valley in the year 1845, and can state pretty clearly the character of the diseases prevailing at that time and since that period. Malaria might be said to be the prevailing trouble for many years; especially was this the case during the later summer and fall months. The most sickly year during my practice was 1846. During that year scarcely a family escaped either intermittent or remittent fever, and I attended twelve cases of pernicious or congestive intermittent fever. In those days people expected to be sick in the fall, and many prepared for it.

My object in writing this paper is to show, notwithstanding the intense malarial character of the locality, more people lived to be over seventy years than in perhaps any district of the State of the same extent and number of population. The valley, in those days, was called the Ponds Settlement, which it still retains. This appellation was very appropriate, as there were many ponds, some of which covered as much as fifty acres of ground. In fact, sixty years ago there existed in the city of Louisville ponds of considerable size on several of the most

popular streets, and in those days the city was troubled a great deal with malarial diseases.

Fortunately, in time the ponds were properly drained or filled up, and Louisville is now among the most healthful cities of the Union. Our old Ponds Settlement is also very well drained, which has also become quite as healthful as other localities. We have now comparatively little malarial disease, which is of mild character.

Fifty years ago there was but little if any malarial disease in the bluegrass section of the State, but consumption and typhoid fever were common, and, of course, to a great extent fatal in character. While that section of the State suffered from those fatal diseases, the Ponds Settlement, though the most malarious district in the State, suffered mainly from diseases due to that cause, which we could relieve. Of course we had some typhoid disease, but not to so great an extent as the highlands. It was a rare thing to meet with a case of consumption which originated in the valley. The large majority of cases of that disease which have come under my observation during the last fifty-six years came from the highlands.

From these remarks one might conclude that malaria is possibly a prophylactic against consumption. This may or may not be the case, but it seems to look that way. Fifty years ago what is termed the Ponds Settlement was very sparsely populated, but since the ponds have been drained and the health improved it is now reasonably thickly populated by an agricultural community, at least double that of fifty years ago. The section of country I speak of contains about fifty square miles, and numbers about five thousand people.

I have collected the names of eight hundred and twenty-five people who have lived in this district and attained the age of seventy years and over within the last fifty years. Their aggregate ages amount to 63,443 years, which gives an average of 77 years to each individual. The oldest person was 105, and several well up in the nineties, and one 100 years old.

I feel confident I have failed to obtain a good many names of old people who have lived and died within the district in that time, as there are several localities I have failed to meet parties familiar with the names of old-time people. There is but little doubt that at least one thousand people were within this period seventy years old and over at the time of their death, including those now living who are past three score and ten.

Therefore I maintain that as to people over seventy years, no other district of the same extent and number of population in the State can show as long a list of old people in the same period of time. There are only about twenty-five colored folks included in the foregoing number of old people. A great many of these old people are still living.

There has been effected a great change for the better in the treatment of malarial diseases within the last fifty-odd years. When I commenced the practice of medicine, remittent fever was quite fatal, owing to the manner in which it was treated.

The first thing the doctor did on visiting a patient with this fever was to bleed him pretty freely, then vomit him, next purge him, and nearly starve him until the fever was reduced sufficiently low, in his estimation, to give quinine; and unfortunately by this time the patient was at the margin of the grave, and often fell in before quinine got him away. No difference how much fever existed, patients were not allowed to have cold water. What water they had was to be warmed by holding a piece of light-bread, the size of two fingers, in the blaze until it was scorched black, and while hot dipped in a glass of water to warm it sufficiently. This treatment to the mind of the common thinker is contrary to common sense.

My idea is, that if quinine is good for fever, it is good for it when on as well as off. It has always been my practice to give quinine freely in malarial fever, first, if necessary, relaxing the bowels; also to let the patient have as much cold water as he wants.

I recollect of losing but one patient with remittent fever; that was a colored man with the congestive form in the year of 1846, when this fever was epidemic.

In speaking of old age, you now and then hear a person say that he does not want to live to be old, but those so talking are usually young people and have an idea that old people can not enjoy life; but we old people who are in good health can assure them that if they live to be old and can take a retrospective view of their past lives, and that second self, their *ego*, called conscience, says "all's well," they can, at the age of three score and ten, the time allotted to man during the time of the wise king, enjoy life as well as when young.

SURGICAL TREATMENT OF INGUINAL HERNIA.

J. T. DUNN, M. D.
LOUISVILLE.

The results of recently devised operations for the cure of inguinal hernia have been so remarkable that I do not hesitate to hold up before you the present compared with the past.

This once hazardous operation is no longer considered so. Czerny's method, devised in 1877, and practiced throughout the surgical world until 1890, gave a mortality of 11⅝ per cent, with from 30 to 40 per cent of relapses. This high mortality and per cent of relapses led up to the present method of performing herniotomy, and the results have been most gratifying, to wit: ten thousand cases (excluding strangulated cases) operated upon from 1886 to 1897 show a mortality of nine tenths of one per cent.

In 1895 Bassini reported five hundred and sixty successive operations by the method which bears his name, without a single death. Marcy did over two hundred without a death; Macewen, eighty-one without a death; and Coley, two hundred with but one death, and that was by ether-pneumonia on the eighth day. Here are ten hundred and forty-one radical-cure operations with but one death.

As to relapses, Bassini had operated upon fifty-four cases, forty-one of which had been traced from two to nine years when his paper was written, and not a single relapse had occurred. Later he reported 560 cases with 15 relapses (less than 3 per cent); Halsted, 180 cases with 3 relapses (1.6 per cent); Marcy, 133 cases with 6 relapses (4.5 per cent); Coley, 160 cases with no relapses. Here, then, are 1,033 cases operated upon with only 24 relapses, or only 2.3 per cent.

You may say these cases have not run long enough to determine fully the results. Perhaps so, but a study of the following cases of relapses will be of interest in deciding this point: Three hundred and sixty cases of relapsed herniæ following various methods of operating show 80 per cent to have occurred during the first year after operation, and of this number 64 per cent occurred during the first six months, and only 11.9 per cent occurred after a period of two years had lapsed. Of the cases that relapsed after two years, five occurred between ten and twenty-two years after operation, seven between five and ten

years. In one hundred out of three hundred and sixty cases of relapse the operation was done for "strangulation." (International Text-book of Surgery, page 498, Vol. II.)

From this report we are apparently justified in concluding that if a case does not relapse within one year, chances are strongly in favor of its not doing so; and if it remains well for two years, chances are exceedingly small for relapse to occur.

It is estimated that fully 95 per cent of cases operated upon by Bassini's method will be followed by cure. In this connection it is interesting to note the most prominent causes of relapse. Chief of all is lack of primary and permanent union. In all hernia operations perfect primary union is of utmost importance. This depends largely upon two factors: First, cleanliness; and second, the use of suitable suture material. To be sure, trauma inflicted during process of operation plays an important part in defeating primary union.

That statistics show that a non-absorbable suture or ligature material should not be used in this operation is clearly set forth in the fact that in the Hospital for Ruptured and Crippled in seven years there have been twenty-six relapses, and in all of these, silk, silver wire, or silkworm gut were used. Again, the use of absorbable material too small to remain in position sufficiently long for union to take place defeats primary union by allowing the wound to reopen, and it must heal by granulation. Absorbable material which is too heavy frequently will not be absorbed, but becomes a foreign body and is cast off by suppuration.

Indications and Contra-indications to Radical Cure. Childhood and youth give best results with lowest mortality. Coley has operated upon four hundred and fifty children with but one death and three relapses. As a rule, children should wear a truss a sufficient length of time to determine the impossibility of effecting a cure by this means before advising an operation. Children under four years have been operated upon. I assisted in an operation (Bassini's) upon a child about one year old, resulting in perfect recovery. It should be kept in mind by both practitioner and surgeon that about two thirds of rupture in children are cured by the truss; the other one third go on to adult life with rupture. Children with irreducible omentum, or with reducible hydrocele, should be operated upon.

Adults under fifty years of age should be operated upon, provided the health is good and the hernia is not too large and irreducible, under

which latter condition the risk is considerably increased by virtue of old adhesions blending the contents with the sac. Adherent irreducible omental herniæ in middle life are best treated by operation.

Methods of Operating. The methods introduced and lauded by their originators in the past few years are too numerous to mention here. The methods most worthy of note, the methods which have given such excellent results, are Bassini's and Halsted's.

Bassini's method was published in 1888, but was devised in 1885. It consists of a new principle entirely, namely, transplantation of the cord. This method has given remarkable results, and is now the favorite in the surgical world. After exposing the external abdominal ring with its contents (the sac and cord), a director is passed through the inguinal canal to the internal abdominal ring. In this position it has superficial to it only the aponeurosis of the external oblique, which is now divided with the knife or scissors up to the internal ring, thus exposing to view the entire length of the inguinal canal, with cord and sac, *en masse*, lying upon its floor. At this stage of the operation, to avoid confusion and delay when suturing the canal, it is essential to catch with forceps the free edges of the aponeurosis thus divided, and strip or dissect them up with the finger. The upper edge should be freed as high as one and a half inches, and the lower edge down to the deep shelving of Poupart's ligament. I always leave these forceps in position, and find that they not only serve to render it less difficult to locate these structures, but enables your assistant to keep the aponeurosis out of the way while applying the deep set of sutures. The next step is to isolate the sac and cord. This is best done with the thumb and fingers.

I prefer to make the start at the external ring if possible, and, after passing the finger between the cord and sac, it is usually easy to separate them by enlarging the opening occupied by my finger, gently teasing my way to the tip of the sac and likewise to the internal ring above, where it broadens out to form the parietal peritoneum.

The introduction of asepsis in surgery has allayed the fear formerly recognized in opening the sac, and now this may be done with impunity, as we have little or no fear of peritonitis. The profession is about united upon the question of opening the sac. It should be opened in all cases. This permits inspection and reduction of gut or omentum, or enables you to ligate and remove large pieces of omentum

if necessary, and to anchor the gut in close proximity to the opening, if necrotic.

The contents treated as indications require, the sac is now ligated by an assistant over the end of the index finger of the surgeon, which is introduced into the sac as high as the internal ring. This precaution absolutely prevents the possibility of including a portion of gut or omentum in the ligature. Twisting the sac with forceps attached to its apex, after careful inspection, is a method frequently employed by surgeons. The distal end is now removed, and the first or deep set of sutures are now to be applied.

We proceed to this step of the operation by lifting the cord well out of the way by a strip of iodoform gauze in the hand of an assistant, until the line of suturing is complete. This usually requires five or six interrupted sutures, and should be of absorbable material, preferably kangaroo tendon. These sutures include the internal oblique transversalis muscle, the transversalis fascia, sometimes the rectus on the upper side, and are sewed over to the deep shelving of Poupart's ligament on the lower side. The relation of the large femoral vessels must not be overlooked in this step of the operation. The cord is now placed upon its new bed, and the cut edge of the aponeurosis of the external oblique on the upper side is sewed over to the aponeurosis on the lower side. Kangaroo tendon or catgut should be used here, and the suture either continuous or interrupted. Due care should be taken, of course, not to constrict the cord at either its new internal or external opening. The skin incision should be closed without drainage. In Bassini's original paper he advocated the use of silk for these buried sutures, but since 1892 he has employed chromicized catgut.

Halsted's method is very much like Bassini's, yet in several essential points differs very materially. The results obtained by Halsted's method by surgeons in general do not compare favorably with those obtained by the same men doing Bassini's operation. The differences between Halsted's and Bassini's method are as follows: First, in Halsted's method the internal oblique muscle is freely divided beyond the internal abdominal ring, while in Bassini's method only the aponeurosis of the external oblique is cut. Second, in Halsted's method all the veins of the cord, save two or three, are removed, while Bassini's method does not disturb the constituents of the cord. These differences, carefully weighed and tested by surgeons in general, have caused them to prefer Bassini's method.

O'Connor has recently reported one hundred and twenty-nine cases operated upon by Halsted's method, with atrophy of the testicle following in 20 per cent of the cases. This alone would make Bassini's operation the superior method.

Halsted's method, in brief, is as follows: After exposing the external abdominal ring, the aponeurosis of the external oblique, internal oblique, and transversalis muscle and fascia are cut through from the external abdominal ring to a point three quarters of an inch external to the internal abdominal ring. The vas and blood-vessels are isolated, and all but one or two veins removed. The sac is isolated, ligated, and excised. The aponeurosis of the external oblique, internal oblique, transversalis muscle, and transversalis fascia on one side and the transversalis fascia, Poupart's ligament, and aponeurosis of external oblique upon the other side are brought together with six or eight deep Halsted's mattrass sutures (beneath the cord). The cord is now placed upon its new bed and covered by closing the skin incision without drainage.

Choice of Methods. That method should be selected, other things being equal, which is the least complicated. At present Bassini's method is distinctly the simplest, and the evidence is strongly in its favor. Halsted's method is more complicated, and the results obtained by Halsted himself do not equal those obtained by Bassini's method in the hands of other surgeons. Kocher's, Macewen's, and other methods, not removing the sac after ligation, are considered inferior, and do not meet the requirements conducive to permanent cure.

With primary union patients should be out of bed in ten to fourteen days, and a well-applied spica bandage will enable them to be out in a few days more.

To sum up, in conclusion, we learn, first, that mortality has been reduced in the last few years from 11⅝ per cent to less than 1 per cent; second, that relapses have been reduced from 40 or 50 per cent to about 3 per cent; third, that primary union should be the chief aim, and usually occurs when absorbable suture material is used. (Coley buried kangaroo tendon one hundred and eighty times, and secured primary union in one hundred and seventy-four of them.)

THE STERILIZATION OF SUTURE MATERIAL.

AUGUST SCHACHNER, M. D.

LOUISVILLE.

The chances for the infection of a wound are greater from those bodies that are kept in contact with the wound for some time than from objects that are kept in contact but momentarily or for a short space of time. While it is important that all objects to which a wound is exposed should be at least practically sterile, it is highly imperative that those objects that are implanted in the wound for hours or days should be absolutely sterile.

For this reason our packings and suture and ligature material should command our utmost vigilance. Of the suture material we employ, the catgut gives us the most concern. The sterilization of catgut, especially the heavier varieties, is so difficult that for a time many believed that its absolute sterility was impossible. For this reason many operators, particularly on the other side of the Atlantic, have discarded and still discard catgut entirely. Silk has been substituted for the catgut because of its easier sterilization. The history of silk up to the time of its sterilization is a far cleaner one than that of catgut. In fact, if we consider the preparation of crude catgut, it is very remarkable that investigations should have demonstrated that the raw catgut is only occasionally infected with pyogenic organisms. For this reason, as several writers have suggested, most of the catgut has given satisfaction, even though its preparation for final use was of the most questionable nature. The bacteriological tests, and after all these are the only true tests, have not harmonized with the clinical results. The explanation for this discord is not a difficult one. We know full well that in every wound a certain number of organisms find entrance, and that the creation of a wound absolutely free of germs is an impossibility. With a more perfect knowledge of the infection of wounds and the conditions underlying the infection, we have learned to recognize that a wound containing germs is not an infected wound unless the germs which have found entrance into the wound have gained the supremacy in the struggle that always ensues in every wound between the entering germs and the opposing cells. For this reason catgut of a questionable nature from a bacteriological standpoint

may be implanted into a wound without necessarily creating any disturbance. The opposing cells have been sufficient to destroy the organisms contained in the catgut, and all goes well. Should, however, the resistance offered the organism, either by reason of a general impaired vitality or because of some local condition, be insufficient to overcome the invading organisms, trouble will at once ensue.

We should not be satisfied with suture material that gives reasonable clinical satisfaction, but should endeavor to secure the material that will stand the most critical bacteriological tests. It would be somewhat surprising to one who had not investigated the subject to note the numerous methods that have from time to time been devised for the sterilization of catgut — a feature in itself quite sufficient to arouse a feeling of distrust in any of the methods. Dr. G. Brown Miller (Johns Hopkins Hospital Bull., Vol. XI, page 114), of the Johns Hopkins Hospital, has carefully studied from almost every standpoint the more promising methods, namely, Schaffer's, Vollmer's (formalin), Reverdin's (dry heat), König's (cumol), Sweetnam's, and from which the writer has freely borrowed.

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This inquiry has satisfied this operator (Dr. Miller) of the superiority of the cumol method over the others. Catgut prepared by this method is superior, not alone from a bacteriological standpoint, but is stronger and more pliable.

In the cumol method, as modified by Drs. J. G. Clark and G. Brown Miller, the gut is cut into lengths of 35 to 40 cm. or rolled upon spools. It is then heated at a temperature of 85° C. for about two hours to drive out all moisture. According to Saul (*Archiv. f. Klin. Chir.*, Vol. 250, page 100), the average catgut contains 23 per cent moisture and 7.5 fatty matter.

The integrity of the catgut is largely dependent upon the thoroughness of its desiccation. If the catgut is not thoroughly dried before its exposure to a high temperature, it becomes brittle and useless.

After drying the catgut is transferred to the vessel containing the cumol and exposed to a temperature of 160–165° C. for one hour over a sand bath. It is removed from the cumol or the cumol is decanted, and the excess of cumol remaining in the catgut allowed to evaporate by leaving the vessel on the sand bath for one hour longer, the flame having been removed. The rolls of catgut are then placed in wide-mouthed sterile test-tubes, or the reels, if it is so arranged, transferred to their containers. Among the principal points which Dr. Miller

mentions is to have an apparatus arranged in such a manner that the vapor of cumol does not come in contact with the flame or red-hot metal, since the vapor of cumol is heavier than air and is inflammable, but not explosive.

Such an apparatus has been designed by Dr. John G. Clark, of Philadelphia. Dr. Miller has still further elaborated upon this method

by placing the catgut in solutions of formalin of varying strengths before sterilization, thus increasing the time required for its absorption.

The ligature reel herein described was designed to replace the glass boxes, which are generally considered the most aseptic arrangement at present at our disposal. This reel has not alone all the advantages that apply to the glass arrangement, but has some additional advantages, namely: being of metal, we are insured against its breakage, and for that reason never exposed to the danger of an accident to the ligature outfit. Not only this, but the durability of the metal box is greater than that of a glass one. It is true that a glass box has

a slight advantage over the metal one in looks, and for that reason the glass box may still receive the preference when it comes to hospitals.

It is in portability that the metal ligature outfit comes in for its full measure of advantage over its rival, the glass outfit. It is when we are obliged to operate away from hospitals, either in the city or especially in the country, and where we can not always judge the amount and character of suture material that might be called for, that we feel the need of an outfit that is practical in every sense, namely, portability, without danger of breakage, and liberal supply of all possible material.

Another need that this reel will supply is in military surgery, where a large amount of material can be safely carried.

Description of Reel. The reel can be constructed in different sizes; the most convenient for ordinary purposes is the one herein described—a cylindrical box 3½ inches in circumference and 3½ inches space in length. The box is supplied with a double cover to insure the greatest protection to its contents. The first, an outside cover, overlaps the case. The second, an inside cover, screws itself into security by means of threads cut into a strip that is soldered in the inside of the case about ¾ of an inch from the top. The edge of the inside cover is supplied with a narrow flange. When this cover is screwed into position this flange rests upon the strip, thereby doubly sealing the interior. The space between the covers measures ½ inch. From the bottom of the case arises a stationary upright rod. This rod is flared out at the top so as to present a circular surface about ¾ of an inch in diameter. From the center of this surface arises a short screw, and radiating in a crucial manner from the base of this screw are found square excavations to receive the ends of the frames that hold the spools. These frames are held in position (*a*) by accurately fitting into the square excavations; (*b*) by being supplied with a small peg which fits into an aperture near the edge of the square excavation; (*c*) by being held in this square excavation by the impingement from above. This screw arising from the center of the disk surmounting the upright pole receives its mate, a form of thumbscrew, the bottom of which is flared out to correspond to the flared out top of the central pole. From this it is apparent that the purchase gained by this arrangement is similar to vise in its method, but far more effective in its mechanism. The frames that hold the reels are thus firmly held in position without the possibility of any wabble in any direction.

The spools slip into the slots with which the square frames are supplied. The spools are held in the slots by a very simple slide, which, when in position, closes the opening of the slot and prevents the release of the spool.

In unreeling the material (catgut or silk) it is drawn through a "V" shaped opening. The base of this "V" is rounded, giving the effect of a circular aperture, while the apex is drawn to a very slender point. While unreeling, the suture is drawn through the rounded base, and when a sufficient amount has been obtained it is drawn into the slender apex, where it is caught and prevented from falling away.

DISCUSSION.

Dr. J. GARLAND SHERRILL, Louisville: I think the doctor has presented a very valuable apparatus for the sterilization of suture material and ligatures. We are always at a loss for something in which to carry about our suture material without having to fear that it will become infected. This box seems to be the proper carrier, in addition to being splendid for the disinfection of the material. As it is absolutely air-tight, there is no possibility of its becoming infected.

Dr. SCHACHNER (closing the discussion): Only those who are engaged in the practice of surgery know of what value this method is, because the suture material is placed in this box and allowed to remain there. It is not the instrument we use nor our hands that carry the infection, as these can be cleaned, but when we put a suture or ligature into a wound we put in something that remains there. We have here a means of rendering this material perfectly sterile. Often after we have it sterile most surgeons are compelled to carry it in a miserable way, one which favors the occurrence of an infection. Some years ago I devised another reel somewhat different from this, and this is my second effort. I hope that when I give this a thorough test it will give complete satisfaction.

HIP-JOINT AMPUTATION: WITH REPORT OF A CASE.

WILLIAM O. ROBERTS, M. D.

LOUISVILLE.

To Dr. Walter Brashear, of Bardstown, Ky., is due the credit of having performed the first hip-joint amputation in this country. It was done in 1806 for compound fracture, and the patient recovered.

Le Dran included amputation at the hip-joint in his demonstrative courses in 1739, and read a paper on its feasibility before the French Academy. The year previous, however, Moran and his pupils, Volkes and Pritchard, had also practiced it upon the cadaver, so it seems the operation originated with them.

The first successful case on record was that of Penault, in 1773. The operation was done for gangrene. The earliest cases in which the operation was used for caxalgia were those of Kerr and Thomson, in 1774 and 1778. Both were fatal, and the operation seems not to have been done again for this disease until the latter part of the last century.

"Amputation at the hip-joint in reality owes its existence to the French Revolution. In 1794 the elder Blanden performed it thrice, with one recovery. During his different campaigns Larrey repeated the operation several times and gave it a standing among surgical procedures, although it is doubtful if any of his cases recovered."

The first successful case where the operation was done for gunshot wound was that of Brownrigg in 1812. The most complete tabulated list of cases up to 1881 is that of Dr. F. C. Shepherd in Ashhurst's International Encyclopedia of Surgery. It contains 633 cases with 393 deaths, and in 20 cases the result was unknown, making a general mortality of 64 per cent. Where the operation was done for disease the mortality was 40½ per cent, and 66 per cent in cases of injury. The highest mortality was in cases of gunshot injury, being 87⅓ per cent.

John A. Wyeth, in a paper read before the New York Medical Society in October, 1900, gives a list of 267 cases that have been operated upon under his method of controlling hemorrhage, with 53 deaths, or a general mortality of $19\frac{8}{10}$ per cent. Where the operation was done for disease the mortality was 17 per cent, and $63\frac{9}{10}$ per cent in cases of injury. By comparing these tables it will be seen that while the death-rate has been greatly reduced within the past ten years in cases where

the operation has been done for disease, there has been very little reduction of the mortality in cases of injury.

In a letter to the reader, dated April 22, 1901, Dr. Charles McBurney says that since resorting to his method of preventing hemorrhage, namely, direct pressure of the common iliac by the finger of an assistant through what is known as his gridiron incision, he has had no loss of blood and no patient has died as the result of the operation, or soon afterward from any cause. Several have died months later from recurrence of sarcoma. The advantages claimed for his method are: "The whole operative field is perfectly free from incumbrance of any kind. Cases requiring a very high anterior incision can be most satisfactorily handled. It is the only method applicable to amputation for extensive tubercular disease about the hip-joint and upper part of the femur, and the method has no disadvantages."

The special dangers which render amputations at the hip-joints such a formidable operation are from hemorrhage and shock. According to Lunning, "5 per cent of all patients operated on do not survive the operation, and 70 per cent of deaths occur within the first five days."

Various methods have been suggested for preventing hemorrhage during the operation. Larrey advised preliminary ligation of the femoral artery; Pancoast, Lister, Esmarch, and others, instrumental compression of the abdominal aorta; Gross and McEwen, digital compression, by an assistant, of the same vessel; and J. J. Buchanan, of Pittsburgh, in 1888, in a paper read before the Pennsylvania Railway Surgeons' Convention, suggested "the opening of the abdomen and direct digital compression of the aorta through the incision," and Dr. Neal Hardy, of Sandusky, Ohio, used this method in a successful case in November, 1890. Woodbury, of Philadelphia, and Van Buren, of New York, advised digital compression of the common iliac, by the hand of an assistant, in the rectum; and R. Davie, of London, used for the same purpose a long rod with a knob on its end, known as the Davie lever. McBurney, of New York, in 1894 called the attention of the New York Surgical Society to his method of direct compression of the common iliac artery by the finger of an assistant, through what is known as his gridiron incision. W. L Estes, of Bethlehem, Pa., practiced gradual dissection, in which the femoral vessels are first exposed, tied, and divided between two sets of ligatures. "The flaps are then formed as may be indicated, and the soft parts divided as for any operation of the body where a tourniquet can not be employed,

all known vessels being secured before they are divided, and all others caught with forceps as soon as severed."

Jordan Lloyd, in 1883, used an Esmarch bandage in figure-of-8 turn around the hip and trunk, placing a roller bandage as a pad beneath it for pressure on the external iliac. Richard Valkman, in 1874, reports three cases in which, after driving the blood out of the limb into the body with an Esmarch bandage, he "placed an elastic loop in the femoral (*scrolure commissure?*), drawing the ends upward and outward, the anterior passing parallel with Poupart's ligament, the posterior near the gluteal fold, in which position it was held by an assistant. To further secure it in position, loops of roller bandage were thrown beneath the rubber tourniquet in front and behind, and upon these, during the operation, upward traction was also made by an assistant."

Trendelenburg devised a steel rod to be passed through the soft parts in front of the joint, and a rubber tube to be wound around its protruding ends in figure-of-8 turns. After the anterior flap is made the vessels are secured, and the rod is then placed through the soft parts behind the joint in a similar manner before the posterior flap is made.

Wyeth's method consists of two mattress needles, one introduced one inch below and slightly to the inner side of the anterior superior spinus process of the ilium, passing beneath superficial muscles and emerging on the outer side of the hip about three inches from and on a level with the point of entrance. The other enters an inch below the level of the crotch, internal to the saphenous opening, passing through the adducta muscles and coming out an inch below the tuberosity of the ischium. The points of the needles are shielded with corks to prevent injury to the operator. A thick pad of gauze is placed over the femoral vessels. Above these needles a piece of strong rubber tubing is wound around the limb over the pad six or eight times and tied.

Senn first disarticulates the head of the femur through a long perpendicular incision over the trochanter, and then, with a long pair of forceps introduced into this incision and passed through the limb to the inner side, where a counter opening is made for them to emerge, he grasps a piece of rubber tubing in its center and pulls it through the limb. The tubing is then divided, and one part of it is tied anteriorly around the anterior portion of the thigh; the other is passed around the posterior portion of the thigh, and then brought around the anterior portion and tied, thus doubly securing the flap containing the femoral vessels.

As to the different methods of prevention of hemorrhage, I believe with Rudolph Matas that "none can compare with Wyeth's in their general application, thoroughness, simplicity, and wide range of usefulness." Hot salt solution has played a very important part in lowering the death-rate of this as well as of other big operations. While it is of incalculable value in shock from loss of blood, it is also very beneficial in surgical shock without hemorrhage. The best effect is secured when the saline solution is given by intravenous infusion. The temperature of the solution should be from 101° to 115°, and it should be injected slowly at about the rate of a pint in fifteen minutes. Dawbarn suggested the idea that to introduce the hot salt-water directly into the blood-current would bring the heat immediately into the heart, and thereby stimulate the heart and respiratory center of the medulla, and when administered in this way would also increase the circulating fluid much more quickly. The quantity of the saline to be used will depend, of course, upon the condition of the patient, the amount necessary varying from one half to as much as four pints. In cases of injury, where the shock is slight and the loss of blood trifling, amputation can be done at once. Salt solution, while not absolutely necessary, can do no harm, and should be used as a safeguard.

In cases of inquiry, where the shock is marked, either from loss of blood or the nature and extent of the injury, we should endeavor, by the use of saline solution, warmth to the surface of the body, elevation of the foot of the bed, together with atropia, strychnine, and small doses of morphine given hypodermatically, to bring about reaction before attempting to operate.

"Amputation should not be deferred too long; after perhaps six hours, each hour increases the danger of infection. In the majority of cases, if the patient is to recover at all from the shock, some signs should be seen in from four to six hours."

I myself have operated upon two cases, both of which recovered. These cases have been reported to our local societies. The first one was an old hip case. The patient was thirty-five years of age, a very small, thin woman. She had had hip disease since early childhood, and ankylosis had taken place with the femur almost at right angles to the pelvis. The limb was greatly atrophied, and there were a number of fistular tracts. Dr. Ap Morgan Vance, who assisted me, by pressure with his thumb on the femoral artery, and at the same time almost encircling the limb with his hands, so completely controlled all vessels

as to render the operation practically bloodless. Of course the Esmarch was used to drive the blood from the limb into the body first. The second case was one of railway injury. The patient, a negro man, aged thirty-one, fell from the platform of a Pennsylvania train, and his left thigh was run over at the middle third. The bone was crushed and soft structure lacerated nearly to the hip-joint. There was a rent in the skin over the femoral vessels extending near to Poupart's ligament. When he reached the hospital, about three hours after receipt of injury, his pulse was only 84 and fair as to volume, temperature 98° F. So the operation was done at once. As the soft structures were so badly contused and lacerated, it was decided to do a preliminary ligation of the femoral high up, and then make the pass slowly, catching the vessels as they were divided.

Dr. Thomas L. Butler assisted me in the operation. The amount of blood lost was very trifling. The man made a good recovery. We were afraid — from the amount of contusion of the tissues — that the flaps would slough, but they did not. There was, however, some suppuration.

THE CLINICAL EXAMINATION OF THE BLOOD IN DIAGNOSIS.

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STANFORD.

The blood as a means of diagnosis occupies a very unique place in medicine. In a few affections it furnishes a ready-in-hand diagnosis, and in others it may be as valuable, as in the diseases that carry in the blood the diagnosis with them.

The blood is a tissue that can be successfully studied during life, and its intimate relation with all the other tissues, carrying life or perhaps death to every cell in the body, makes it important that we appropriate all the knowledge its study may disclose. We should be familiar with the physiology, morphology, and pathology of the blood, that we may differentiate the pathological from the healthy, and I shall, therefore, at the risk of being trite and prosy, give a meager analysis of the composition of normal blood.

The average number of white cells is 7,500, red cells 5,000,000 per cubic millimeter, and any marked deviation from these numbers, except in the anemia of the old and the plethora of the newborn, is pathological. A parallel increase or decrease of hemoglobin with corpuscles gives index colors =1; an increase of hemoglobin gives index + 1, and a dimunition index —1. The five varieties of white corpuscles that aid in diagnosis are the large and small lymphocytes, the polymorphonuclear neutrophile, the eosinophile, and the myolocyte. Leucocytosis is an increase of the leucocytes without diminution of the polymorphonuclear; lymphocytosis is a relative increase of the lymphocyte without a total increase of the other varieties. We may, in a measure, project the degree of health, and in children the degree of development, as the polymorphonuclears predominate over the other varieties. The eryethrocyte is of special diagnostic and prognostic value in differentiating diseases, but can never equal the leucocyte in the diseases to which I shall in brief call your attention.

Anemia. Anemia is one of the most common affections of the blood, and may be defined as a diminution of the corpuscles or hemoglobin, or both; the serum can only be temporarily diminished. A blood examination readily discloses the pathology, enabling one to make a diagnosis of not only anemia, but also the degree of anemia, and whether or not we have to deal with a secondary or fatal form. A mild form of anemia is characterized by a diminution of the hemoglobin and specific gravity; the severe form by poikylocytosis, by changes in the staining properties of the red cell, by a less number of red corpuscles, by the macrocyte and microcyte, and by the nucleated red cells, viz: the normoblast, the microblast, and megaloblast. The presence of a large per cent of normoblast in the circulation means a great number are thrown into the circulation from the bone marrow before maturing. They are young red corpuscles, the home of which is the bone marrow in health and peripheral circulation in those diseases that require rapid corpuscular reproduction. Their presence indicates a heavy drain upon the system by hemorrhage or disease. They are of more favorable prognostic value than the megaloblast, which is never found in the circulation in health, but circulate in increased numbers in the pernicious and fatal forms of anemia. In severe hemorrhage the tissues supply the depleted serum, but the bone marrow can not so rapidly supply the cellular elements, making the blood-count very low. This may be of very practical import in cases of

injury, where it is often impossible to tell how much blood has been lost and whether or not the patient is suffering from shock due to loss of blood, from concussion, or from the mangled tissues. In either case there can not be a shock without a concurrent low blood-pressure, and if shock is due to hemorrhage, transfusion is the remedy, but if due to concussion, transfusion would increase the shock.

Pernicious Anemia. The blood in pernicious anemia is pale and watery; the red cells do not generally fall into rouleaux, and resemble the blood of the lower animals. The degenerative changes of the red cell are characteristic. They are large and oval, contrasting with the smaller washed-out chlorotic cell. The most striking characteristics are the decreased number of red cells, the average being 1,000,000, lymphocytosis, and the nucleated cell. The megaloblast, when more numerous than the normoblast, establishes the diagnosis *per se.*

Chlorosis. The blood of chlorosis is readily distinguished from pernicious anemia, but from grave secondary anemias it is more difficult. The blood-count gives 4,000,000, index color low, contrasting with high index of pernicious anemia. A striking feature is the excessive pallor without material diminution of the red cell. Hemoglobin 40 per cent or less. Oligochronemia is the distinguishing characteristic of chlorosis, and even this is not sufficient to make a diagnosis, though it aids in differentiating from diseases like pernicious anemia that have high per cent hemoglobin. The red cells are uniformly smaller and paler than in the secondary anemias, where the red cells are more irregular in size and staining qualities. The chief diagnostic point may devolve upon the white cell, an increase of which would aid in excluding chlorosis from malignant disease and the different suppurations. Stengel has shown, however, that with the blood examination the history and course of the disease must be taken together before any diagnosis can be made.

Leukemia. The blood in each variety of leukemia is specific in diagnosis, and in each type the blood is different. In no other disease can a blood examination be of more value, and, in fact, it furnishes the only positive diagnosis between Hodgkin's disease and leukemia. The pathology of both diseases, outside of the blood inself, is the same, and post-mortem fails to find any difference. A diagnosis in the myelogenous type can be made by the great number of myelocytes, and the lymphatic type by the lymphocyte. The presence of a large per cent of the polymorphonuclears would exclude leukemia from leucocytosis.

The red cells are somewhat diminished, but not sufficient to aid in diagnosis. The nucleated red cell is greatly increased, and may reach as high per cent as in pernicious anemia. The myelocyte is found in great numbers; the least count always gives 100,000. They are larger than the other leucocytes, and give, therefore, the appearance of the blood as being composed mostly of myelocytes. The polymorphonuclears, lymphocytes, and eosinophiles are increased because there is a leucocytosis, but their percentage is not increased, the increase being in the myelocyte. The cell characteristic of leukemia is the myelocyte, and only by its presence can a diagnosis be made. Lymphatic leukemia is conspicuous for the absence of both the myelocyte and the nucleated red cell, and the diagnosis must devolve upon the large per cent (90) of lymphocytes. Malignant disease and tumors of spleen and kidneys might simulate leukemia, but the leucocyte, being the polymorphonuclear, would readily clear the diagnosis.

We have seen that the myelocyte is characteristic of myelogenous leukemia, the lymphocyte of lymphatic leukemia, the megaloblast of pernicious anemia, the polymorphonuclear of leucocytosis, and eosinophile, perhaps, of trichinosis. Leucocytosis is present in all inflammatory affections, and aids in differentiating typhoid, tubercular, and malarial infections from septicemia, peritonitis, appendicitis, endocarditis, meningitis, salpingitis, and osteomyelitis. Inflammatory leucocytosis is the key that unravels the skein in those diseases that often have the same symptoms in common. In all tubercular serous inflammations the white cell count is low in contrast from rheumatic and septic serous inflammations. Where the white cells may number 40,000, epidemic or sporadic cerebro-spinal meningitis due to meningococcus, pneumococcus, and influenza bacillus has such an increase of the leucocytes that the blood reveals this disease from tubercular meningitis.

Serum Diagnosis. The serum of the blood is employed to-day very extensively in diagnosis. The reaction of the different serums upon bacteriæ as manifested in the many infectious diseases, viz: Malta fever, cholera, anthrax, dysentery, plague, and typhoid fever, is invaluable.

The Widal reaction of typhoid fever as a means of diagnosis occupies a very necessary place in the obscure and irregular cases. There are different opinions as to the serum dilution and the time for clumping in typhoid fever, but 1–20 dilution with a time limit of one hour appears

to be satisfactory, although a higher dilution, 1–100, may be necessary to make the test absolutely certain.

The blood of 95 per cent of all cases shows clumping during the course of the disease. I shall not enter upon serum pathology and its relation to immunity, natural and acquired, or to bacterial dissolution, agglutinization, and immunization, or the hemolytic reaction of the serum of one animal upon the corpuscles of different species. Time would forbid such an extended discussion. Neither shall I enlarge upon the diseases in which a blood analysis would aid materially in making a diagnosis after mentioning the spirochete of relapsing fever and the filaria; however, I shall give a brief review of the disease the profession dubs malaria. It very appropriately falls under the title of this paper, as Lavaran about twenty years ago found in examining the blood that malaria was not due to mal-air but to a protozoan parasite, the lowest form of animal life.

This parasite completes the cycle of its development in the red cell, and has also a cycle in the mosquito by which malaria is conveyed from one person to another. It is, therefore, an infection, and, like all infections, requires an agent to spread the disease. Vincent has observed cases in which the transmitting agent seemed to be plant lice and the pollen of plants. The blood shows the various stages of the protozoan development from the bright amboid jelly dots throughout pigmentation and sporulation. The spores are divided into the sporocytes and the gametocytes, the sexual spores. The sporocytes multiply and develop in the red cell to rupture into the blood, and again multiply and repeat their invasion of the red cell *ad infinitum.* The gametocyte does not undergo any further changes in the human body, but completes its cycle of development in the mosquito in about twelve days.

These cytes produce male and female spores, and these coalesce to form a new creature, the zygote, which divides into spores that have the power to move about till they reach the blood circulation, and are then carried to the salivary glands of the mosquito, ready to be injected into another person to begin a new cycle of malarial infection. The blood reveals all these stages, and also the different malarial parasites by which we can differentiate the quotidian, tertian, quartan, and estivo-autumnal fevers. The protozoan parasite excludes many diseases, such as tuberculosis, meningitis, endocarditis, and typhoid infection, from malarial fever.

It has not been my intention to give a minute blood analysis of the above-mentioned diseases, but only a general outline of the more common pathological changes that attend them, by which a diagnosis is made easier and often certain; neither shall I, with due respect for your patience, continue any further discussion of the diseases, the hematology of which is of less diagnostic value than in the diseases I have just recited.

SUBSTANCE, OR CELL LIFE, AND THE GERM CONSIDERED FROM THE STANDPOINT OF NATURAL PHENOMENA.

U. V. WILLIAMS, A. M., M. D.

FRANKFORT.

Carlyle has most tersely said, "The universe is the Great God's fact," and that all its phenomena are not a matter of "just happened so;" neither is nature governed by stratagem nor special providence, but by inexorable law, fixed and unalterable, with no "variableness or shadow of turning," as is the nature of "Thou First great Cause least understood." The time has gone by to search for living organism by a spontaneous aggregation of molecules in vegetable or other infusions, or from a layer of formless primordial slime dispersed over the bed of the ocean. Living matter, during our epoch, has been and continues to be derived from pre-existing living matter, even when it possesses the simplicity of the structure of a bacterium and the morphological unit of a cell. When we consider the cell as the point of organic tissue building, as the primordial, we assume the beginning to be within that cell and capable of nucleus and nucleola *ad infinitum*, beyond the limits of the most powerful microscope and the infinity of further possibilities. We must reach an imaginative point in its genesis where it ceases to be a solid, a substance, and for want of a nicer subdivision we will call it a gas. So with the infinity of the genesis of the germ. Starting with the cocci, which Dorland defines as "any individual organism or spheroid and bacterial cell-form of a group including macrococcus, micrococcus, gonococcus, streptococcus, etc., and then when we have of the single variety of streptococcus seventy-one elaborately classified divisions," we are lost in an impenetrable maze, unless we assume a common origin and let the environment de-

termine the differentiative. Any other form is capable of the same infinite classification, only limited by the number of observers and the power of human endurance to comprehend and classify. Rather is it the part of wisdom and convenience to classify as one common starting-point that we are endowed with a divine organism; constitutional defects and heredity play but a secondary part in etiology. The favorable soil for a disease is a soil made so by defect, usually an acquired one of the normal resisting power, and that starting-point is substance, and let environment determine the variety. Such will be the object of this paper, and, as on former occasions, let us begin with the Great God's fact of Carlyle, Nature, admitting that abiogenesis of cell life can not be refuted, neither can it nor has it been proven.

Substance is defined as "the material of which an organ is made up." Thus we have "Dottel substance," "Substance of Nissl," "Rolando's gelatinous substance," "Rollet's secondary substance," "Sommering's tigroids," and as many others as there are scientists delving in any especial department. All are like the cell, or the coccus, a something whose characteristics and adaptation wholly, like those, depend upon invironment, or catabiotic genesis, the cell plasm lying in its periphery substance. All scientists are joining with Prof. Thurston to-day in asking, What is this real character, the mighty world wonder which the realistic scientist calls nature, or the universe, the idealist philosopher calls substance or cosmos, the religionist calls God? We must admit we know little of its essence. There remains beneath all an apparent unknowable. Haeckel throws no light upon this eternal sphinx-life. The realist, the idealist, and the Christian each once affirmed the possibilities of spontaneous generation, the production of living organism from non-living matter, but they have abandoned that theory. Now they all affirm that living matter is only derived from living matter pre-existing back to the eternal fiat when "God moved upon the face of the waters," and that now we must consider cells and cell life exclusively. Virchow maintains that with a microscope of unlimited power the central cell could be explored with all its intricate and complex phenomena, its chemico-physical results, and be made to give up its secrets. Stallo maintains (page 174) "the explanation of any phenomenon aims at the exposition of its genesis from its simplest beginning or earliest forms." The gaseous form of matter is the true basis for the explanation of the solid form, and not conversely or reversed. And this is possibly in accord with Prof. Lee's conception

of the origin of the solar system when he affirmed "the solar orb at one time filled the entire space of his present system," originating his formula of temperature, constants, and area. Constant is defined: "A datum, fact, or principle that is not subject to change." Area is likewise defined: "A limited space or plane surface."

From Pander in 1817 down to the present time all authors have published certain evidences of the pathogenesis of cell characteristics. Virchow gives three divisions of cell form: ecto, from the Greek, meaning on the outside; meso, or the middle, and puto, the within layers of each cell.

The details of chemical differentiation resulting or obtaining in physiological differentiation have been demonstrated and practical results obtained which are in evidence. Differentiation and morphological species are in perfect accord, one with the other, thereby becoming the rule and the law.

The question is, where and what is the physical law of control? The only answer within our grasp is, "gravity, or tendency toward the center of the earth, weight."

Now let us briefly consider the apparent variations of gravity. Within its bounds are three direct movements: First, the absolute pull toward the earth; second, the balanced or neutral motion sustaining a condition of a horizontal plane, or suspended motion; third, the lighter or the very lightest being driven from the earth (for instance, the gas or substance in the balloon). We can not accept Quarterfaye's theory of ethrodynamics, or gravity overcome.

It is physically axiomatic that the heaviest atom pulling to the earth and filling interstitial spaces displaces and pushes other lighter atoms from the earth. Those of equal weight remain suspended. On these premises we have, on a different occasion, mentioned the three different movements of fermentation (viz: fat, starch, and albuminoids), as using the causative of cell life in its local manifestations, not as generative *de novo*, but as fulfilling an unvarying law of the natural universe. If Virchow admittedly fails to place the origin of the three different motions or agencies of cell form and inevitable results, how and where are we to find it? With this in view, place before the eye, or imagination, a glass vessel holding a normal solution of stimulated, living, fermentable matter, and notice that the individual globule forms explode, divide, reform, precipitate, or rise to the surface, and here take Stallo's proposition, viz., the gaseous form is the true basis to

explain the solid, the nascent, or just form gases separated from other cellular form, place themselves in *in vacuo.* Other macerated or divided cellular forms fix themselves on this vacuo wall; its gases being lighter than water, its natural solvent, the gaseous vacuo is forced by the law of gravity to the surface. During this exit under solvent pressure these divided cells are still giving up and placing in the vacuo their nascent gases, which, enveloped in water, reach the surface and there break or explode. The vacuo gases in contact with oxygen, whether of air or water, and atmospheric pressure resolve themselves into the first or original fibers, gases into semi or absolute solids.

In all of this the plan is essentially dependent upon density and specific gravity. As to what the original fibrous compound is, we may be safe in assuming that it is sugar. Sugar is resolvable into fats, fats into starch, starch into albuminoids, and hence we may have fats, starches, proteids; gases into semi-solids and solids, fiber and tissue. Whether a living cell or a deleterious germ (see Liebig, page 92, on sugar), "the element of sugar yields to every attraction, and to each in a peculiar manner." Again, note that all environments in the processes and evolution of sugar are the identical environments of pathological fiber and tissue. The generation of the one is the condition of the genesis of the other, and *vice versa*, either in vegetable or animal physiology.

If these views are found to be correct, and maybe none can dispute them, then another school, quids and study, lies before us, and we may assert, with Carpenter's concept of "Age, decay, and environment," that density and gravity are the absolute directors of substance, cell forms, and life. Therefore, if density and gravity are lower than life's normal, a way must be found in accordance with their unalterable laws to raise or attenuate; if too high, then to lower.

The so-called germ theory, its movements or specific life, normal or abnormal, its infection, production, multiplication, or reproduction are only subsequent consequences. Gravity, with the above-mentioned law of primal chemistry, that is, acid, base and neutral, is the arc of the circle for all substance, as gravity and density dictate the consequences for good or evil results. Sir Henry H. Rusby (Scientific American Supplement, page 21093) says: "Up to the present time we are practically without mineral or vegetable drugs capable of destroying these vegetable plants, or germs, within the body. Many substances are fatal to them, but only when concentrated to a degree fatal

to our tissues. The problem can only be solved by natural forces working within us."

In the near or far future this will be our concept of therapeutics, as the nuclea, nucleola, or nucleated cells and this unicellular direction, though we differ from the universally accepted opinion that the cell plays an active though not exclusive part in specialization. It is exclusive, this exclusiveness being based on each and every demand of cell life, which is special work. Work demands special movements or kind, which is motion or energy, which is friction, which is heat, which is special oxidation, which is function, which again is demand, and its circle of environment of final results, which is existence or life.

What is true of a cell is also true of a germ, possibly an aborted cell, all formed alike chemically and dynamically, the one normal, the other abnormal, predisposition and environment determining its character and exciting cause, determining production and substance. Deleterious conditions resulting in aborted cell growth produced by fermentation and putrefaction evoluting specific characteristics according to environment; infection or contagion, these determining the specific germ, which conditions are often so obscure or at least so illy defined as to baffle authenticated investigation, as, for example, the germ of cerebro-spinal meningitis, and many other yet undiscovered beginnings. We must not assume that disease is a visitation of Providence, or that drugs have absolute virtues, and that medicines are specifics.

DISCUSSION.

Dr. F. J. YAGER, Campbellsburg: I feel exceedingly stimulated by the doctor who has given us this carefully worked-out outline. He has gone into the matter in such detail and to such an extent that it has given us all a year's work to study it up and to decide for ourselves that he is not in every way just right. He has embraced heaven and earth in his discussion, and he has advanced such a multiplicity of ideas that I do not know just how to grasp them and how to classify them.

It is a great subject, and one requiring much thought and study. I agree with him in his winding up, in that we should not at any time charge things to Providence that come to us on this earth in any shape. I believe we are responsible in every way, and should realize fully that this world and all its concerns are, to a great extent, in our hands, and we should use it properly. I would like to see this audience take hold of this great subject, as it embraces all things that ever were and ever will be. There is still some of the truth to be gotten. On the whole, I wish to commend the doctor on the very good paper which he has presented to us.

THE CONDUCT OF THE SECOND STAGE OF LABOR IN PRIVATE PRACTICE.

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LOUISVILLE.

It is an established fact that many practitioners attend cases of labor entirely unprepared for conducting them according to the well-known principles of modern obstetrics, relying upon the unclean materials that are furnished them at the bedside to perform the necessary manipulations of the case, also neglecting to cleanse their hands and instruments properly. With the knowledge that this neglect may result in serious disease and perhaps death of the mother, such conduct is as unjustifiable as it would be to perform a surgical operation with the table cutlery and other materials that could be found in the homes of our patients.

Every one recognizes that the aseptic details possible in well-regulated hospitals and infirmaries can not be expected in private practice, especially among the poorer classes; but the physician should strive to conduct his work on the lines carried out in such institutions, and come as near that standard as his surroundings will permit. With the paraphernalia contained in this little package, which can be easily taken to every labor case, and with a few clean sheets and towels, hot water and soap, every reasonable demand of aseptic obstetrics can be complied with.

This package contains a hand brush, small package of sterilized gauze, two oz. powd. boric acid, two oz. lysol or other liquid antiseptic; scissors, linen tape or corded silk for the cord, chloroform, one half doz. five gr. quinine pills, sol. two per cent nitrate of silver, ergot, dropper, needles, silkworm gut, needle holder, perforated shot, and a soft rubber catheter.

The package is described in detail, together with instructions for the preparation of the patient for labor, in an article on "Asepsis in Labor" published in the Louisville Monthly Journal of Medicine and Surgery, November, 1900.

As to the preparation for the second stage of labor. The vulva, thighs, and abdomen of the patient having been thoroughly cleansed, a clean folded towel placed over the vulva and fastened to the garments

in front and behind, and a clean nightgown over this, the patient is ready for bed. This has been previously prepared by placing a piece of oil-cloth over the mattress, a clean sheet upon this, and then at the place where the hips of the patient will rest, a clean sheet folded several times or a bran bag. The bran bag is made by preparing a bag of cheese cloth, one yard square, boiling it thoroughly with soap and water, and filling it with one half bushel of clean sifted bran. Either of these expedients serve to absorb the discharges during delivery, the bran bag more so than the sheet, and the patient is spared the discomfort of lying in a pool of blood and liquor amnii until labor is completed.

The patient is put to bed in the dorsal position, the pad removed from the vulva, the nightgown neatly folded up to the umbilicus and held in place by a few safety-pins. A folded sheet extends from the neck of the patient to the symphisis pubis, another from the feet upward, overlapping the first. In cold weather a blanket may be placed between each sheet. The physician in the mean time has made his preparations for the aseptic conduct of the labor.

A clean towel is laid upon a chair, upon it two clean cups filled with boiling water, and in each is dissolved a teaspoonful of powdered boric acid. In one is placed two ligatures for the cord of silk or the linen tape before mentioned, which I have found excellent for the purpose, and on top of this cup is placed the clean scissors. At the side of the other cup are placed one half dozen pieces of sterilized gauze and a hypodermic syringe filled with aseptic ergot. The front of the chair is occupied by a clean basin, holding a half gallon of one per cent lysol solution or other antiseptic, according to the preference of the physician. At the head of the bed is a little stool or stand for the chloroform mask and bottle.

Having cleansed his hands thoroughly by scrubbing with soap and water, the physician takes a chair by the side of the bed, placing a clean towel across his lap; the chair containing the antiseptic solutions is to the right side and a little behind him, within easy reach of his right hand, which he aims to keep aseptic throughout the labor.

The nurse or attendant sits upon the lower end of the bed and braces the knees and holds the wrists of the patient during pains, and manipulates the lower sheet when the physician makes an examination. The waters have ruptured, and the patient is having the characteristic pains of the second stage of labor. At the onset of each pain

a small quantity of chloroform is poured upon the mask and held to the patient's nostrils with the left hand, which is reserved entirely for this purpose, and should not come in contact with the right hand, which, clean and aseptic, rests upon the towel across the physician's lap.

The diagnosis having been made, vaginal examinations should be avoided entirely thereafter in an uncomplicated case. The progress of the labor can readily be determined by placing the palmar surface of the fingers of the right hand, previously immersed in the lysol solution, against the vulva, the nurse lifting the lower sheet slightly for that purpose.

When the head distends the vulva and does not recede between pains, then it should be pushed back to prevent anemia of the parts and greater liability to rupture. When explusion is about to take place, a larger quantity of chloroform than usual should be poured upon the mask and the presenting part allowed to slip out slowly with as little injury to the perineum as possible. Pressing the part toward the symphisis pubis is the best means to use for this purpose. Immediately after the birth of the head a piece of gauze wrapped around the right index finger is dipped into the boric acid solution and used to mop the mouth and free the nose from mucus to prevent its aspiration into the trachea when respiration is established. The head is then directed toward the symphisis pubis, and with the next pain the posterior shoulder is released; then directing the parts toward the perineum, the anterior shoulder and the trunk slip out. The child should be grasped by the legs and held head downward for a few moments until it cries lustily, then wrapped in the baby blanket ready and warmed for that purpose, and laid upon the abdomen of the mother between the umbilicus and symphisis pubis. This position was suggested in one of the late journals on obstetrics, and having tried it in a number of cases, I recommend it as a better procedure than the customary one of letting the child lie between or across the legs of the mother, or held by an excited attendant. On the abdomen of the mother the child is free from the mess that always accompanies the discharge of the ovum, the mother lies quietly, exhausted by her previous efforts, and the weight of the child may perhaps in a way be a safeguard against post-partum hemorrhage. The necessary manipulations can be conducted more readily than when the child lies between the legs of the mother. The child should lie upon the right side with its back turned toward

the face of the mother, as that position is said to favor the closure of the foramen ovale.

While waiting for the cord to stop pulsating, the eyes of the child are bathed with pledgets of gauze dipped in the boric acid solution, and a drop of two-per-cent solution of nitrate of silver is placed in each eye at the outer canthus. After fifteen minutes, or when the cord has stopped pulsating, it should be ligated with the linen tape which has been lying in the boric acid solution in the other cup during this time. It should be tied toward the mother and then within an inch and a half of the child's abdomen, tying it, as with a large pedicle, a double knot, then bringing the ligature around and tying on the other side. The cord should be wrapped in a small piece of sterile gauze and the child turned over to the nurse. After the baby has been anointed with olive oil or fresh lard and the excess of grease wiped off with a soft cloth, the physician dresses the cord by cutting a hole in the center of a piece of gauze about four by eight inches, draws the cord through it, dusts it liberally with powdered boric acid, and folds the gauze smoothly over it; instructs the nurse to fasten the belly-band over this, and not to disturb the gauze until the cord drops off.

This is the conduct of the second stage, with about as much asepsis as can be expected in the ordinary homes. In the majority of instances it is sufficient, and there need be but little fear of infection when these details are carried out. No especial or expensive paraphernalia is required, the few articles needed can always be kept ready for immediate use, and accordingly there can be no excuse for a neglect of such precautions.

SOME INTERESTING EXPERIENCES IN OBSTETRICS.

W. E. SLEET, M. D.

MIDWAY.

It has been said, and doubtless is true to a great extent, that a great number of the most important cases occurring in the hands of the country practitioner have never been reported, and that, therefore, medical science and medical literature have been baffled to a great extent in their great struggles of "upward and onward." By this remark I have been prompted to simply report a few cases which have

occurred in my practice, which, to my mind, seldom occur in an ordinary practice.

It is not, however, my purpose within the scope of this paper to discuss any point of the details, technique, or management of cases of labor, either normal or abnormal; neither do I propose to discuss the etiology or pathology of the cases to be reported, as it would require more time than is alloted by this Society for a brief paper.

CASE 1. Was called October 27, 1897, to attend Mrs. W., age forty, primipara; married twenty years; patient was delivered by the use of chloroform and forceps, after several hours of hard labor, of a well-developed male child weighing about twelve pounds. The child was "stillborn." In delivering the placenta it was found to contain another child, in which it was evident that development had ceased about the twelfth or fifteenth week of gestation; the placenta, a very large one, to all appearances in a perfectly normal condition. Two children attached to one placenta, one fully developed and the other undeveloped.

CASE 2. Mrs. L., age twenty-five, multipara; called to see me at my office October 1, 1900, she then being in the eighth month of pregnancy, stating that she desired an examination, as she had an abnormal growth within the vagina. Upon examination there was found situated upon the anterior wall of the vagina, just under the pubic arch, a growth about two to two and a half inches in length and about one and a half inches in diameter, hour-glass in shape, the distal or vaginal end of which having a cauliflower-like appearance, from which exuded a milky-like, creamy, odorless discharge. It being so near the time of expected labor no surgical procedure was advised. On the 13th of November, 1900, she gave birth to an eight-pound child, suffering no inconvenience whatever from the growth, as during labor the mass was brought down and outside of the vagina, and held outside until the passage of the child, when it was allowed to recede. The puerperal state was passed in the usual way without any complications whatever. Now six months since the labor occurred, the growth having entirely disappeared, no treatment whatever being used except douches of warm water morning and night.

CASE 3. Mrs. P., age eighteen, primipara; gave birth to her first child December 10, 1894, who is now a strong and well-developed boy of nearly six and a half years of age. On December 10, 1897, she gave birth to a second child, a son, also well developed and weighing about

eight pounds, which died December 14th, four days after birth, from icterus neonatorum. On October 21, 1898, she gave birth to a third child, a son, also well developed and weighing about eight pounds, which died October 24th, three days after birth, from icterus neonatorum. On January 29, 1900, she gave birth to a fourth child, a son, also well developed and weighing about eight pounds, which died February 1st, three days after birth, from icterus neonatorum. On March 17, 1901, she gave birth to her fifth child, a daughter, also well developed and weighing about eight pounds, which died March 21st, four day after birth, from icterus neonatorum.

The patient was attended by Dr. R. W. Hicks, of Midway, Ky., during the birth of the fourth child, and by Dr. W. H. Coffman, of Georgetown, Ky., during the birth of the fifth and last child.

Post-mortem by Dr. Hicks and myself upon the fourth child revealed the fact of the absence of the common duct, or ductus communis choledochus, instead there being only a small fibrous band. Liver normal size; no cirrhosis; gall-bladder in a rudimentary condition, and contained about half drachm of a serous fluid; hepatic and cystic ducts apparently normal.

If you will note, these children were all perfectly developed. From twenty-four to forty-eight hours after birth they gave no evidence whatever of icterus, the first symptom being that of vomiting, after which the discoloration of the skin would appear in a few hours, becoming more and more pronounced, after which the children would become perfectly limp or flaccid, or so-called "limber-neck," regurgitating all fluids and dying within a few hours.

Four cases of grave icterus neonatorum, the children of one mother, in successive births, all resulting fatally within seventy-two to ninety-six hours after birth.

MISCARRIAGE AND ITS TREATMENT.

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A not uncommon division of this subject is into abortion, miscarriage, and premature birth. Abortion is usually applied to the expulsion of the ovum before the fourth month, at a time when the placenta is not yet fully differentiated from the remainder of the chorion; a miscarriage to the expulsion from the end of the fourth month to the end of the seventh month, when the child is viable, and premature birth from this time to the term of pregnancy. It is the writer's opinion that this difference should be made between a miscarriage and an abortion.

A miscarriage is an expulsion of the contents of the gravid uterus before the fetus is at a viable age, and when the expulsion is not produced by criminal measures. If the expulsion is due to criminal procedure, then the term abortion should be used instead of miscarriage.

The degree of development of the ovum makes a difference in the phenomena of the miscarriage. A miscarriage at the first or second month is not similar to one of the fifth or sixth month. During the fifth or sixth month a miscarriage is very much like a labor at full term. At the first month it is similar to a painful menstruation. During the second month the pains come with some regularity, and at the third month this is more marked, and continues to become more marked as the pregnancy advances.

The course of a miscarriage is pain, hemorrhage, dilatation of the cervix, and expulsion of the contents of the uterus. If there is persistent hemorrhage, miscarriage usually occurs, but even in spite of a bleeding which may continue for a considerable time or return at intervals during the whole duration of pregnancy, the case may go on to term.

If the cervix becomes markedly softened and the os dilates, the ovum will ordinarily be cast off, and yet the os has dilated sufficiently to admit two fingers, but has again retracted and pregnancy has pursued its course. Playfair has reported cases in which four or five fragments of decidua, each as large as a fifty-cent piece, were cast off in the third month of pregnancy, but the woman went on to term.

If the hemorrhage is persistent; if the os dilates; if there is felt presenting within the os the ovum; if the pain is considerable, and, above all, portions of the ovum are expelled, the miscarriage may be pronounced inevitable. Tarnier calls attention to another sign which he believes to be valuable as indicating an unavoidable miscarriage. This is the effacement of the rather acute angle formed anteriorly between the neck and body of a pregnant uterus. The disappearance of this angle indicates a contraction of the longitudinal fibers of the uterus and a descent of the ovum.

Before the end of the third month, while the placenta is not yet fully developed, a woman is more apt to miscarry, and also at the time for her menstrual period. Sometimes in the early months the fetus is torn through the decidua, and the chorion and the amnion are thrown off afterward; this is more apt to be when an abortion has been produced by instrumental means.

It is well to have the expelled portions saved, so you can tell what is retained. The placenta is usually retained a long time in the early months, because the attachment is strong and fatty degeneration does not occur soon; also, in the early months the placenta is not large enough to stimulate uterine contractions. The prognosis of a miscarriage is good if every thing has been expelled; if not, it is bad, the retained parts leading to hemorrhage, sepsis, and disease of the uterus.

While the membranes are intact there is very slight danger of hemorrhage. A miscarriage should not be dangerous to the mother, but the after-effects may be bad. Uterine disease often follows, because the women do not take the same care of themselves as they do at full term. A miscarriage is very rare without some hemorrhage; this is due to the vascularity of the membranes in the early months. Earlier the miscarriage, sharper are the pains, and less the bearing-down feeling. A few pains may cause expulsion, or the pains may last for days and even months before expulsion of the ovum. In an incomplete miscarriage pain and hemorrhage will continue as long as any portion of the ovum is in the uterus. Can not tell how soon a miscarriage will terminate. May have pains and hemorrhage and patient will not miscarry. This is known as a threatened miscarriage.

Pain and hemorrhage do not mean that a woman is going to have a miscarriage or even threatened with one; she must first be pregnant; so you might mistake pain and hemorrhage of a polypus, a fleshy mass, or a fibroid for a threatened miscarriage.

The treatment of a miscarriage will differ much accordingly as we wish to prevent or hasten the expulsion. The prophylactic treatment consists of removing the cause, the most frequent being syphilis, posterior displacements, endometritis associated with laceration of the cervix, and the habit of miscarriage. If the father has had syphilis, place both the man and woman upon anti-syphilitic treatment. If the woman, place her upon the treatment before and during the pregnancy.

In posterior displacements of the gravid uterus replace it and keep in position; the uterus must be replaced at or before the third month, and held in position until the end of the fourth month. At this time the uterus has risen out of the pelvic cavity, and there is no danger of the fundus becoming caught under the promontory of the sacrum.

If endometritis, it must be treated during the interval of pregnancy. If a lacerated cervix, it must be attended to. The habit of miscarriage, an unscientific term, is only applied to a certain class of cases for which we have no better term. There is, of course, a definite cause in every case of a miscarriage, but sometimes this cause is so slight or obscure as to entirely escape notice. There are many delicate, refined women of nervous temperament in whom the mere hearing of something unpleasant or repulsive will excite nausea and vomiting, because their nervous systems are thoroughly hyperesthetic, and in this class of cases the slightest cause is often sufficient to induce a miscarriage. Such women are so constituted as to their nervous systems that it takes very little to make the uterus bear down on its contents and expel them. It is very difficult for a woman of this kind, even under the most favorable circumstances, to go to full term without encountering some occurrence that will give rise to a miscarriage.

In a threatened miscarriage, notice severity of the pains, the amount of hemorrhage, and particularly the degree of dilatation of the cervix. You must by these means determine if it is an inevitable miscarriage. As a rule the hemorrhage in a threatened miscarriage is not so profuse as to cause danger to the mother; if so, you will have to resort to the use of the tampon, but there is danger of the tampon increasing the pains.

Opium enjoys a well-deserved reputation in these cases; it is our sheet-anchor; give it for its effect. A woman can not miscarry without pains. A good routine medical treatment is a suppository of a grain

of the extract of opium morning and night, and a dram of the fl. ext. of viburnum prunifolium three times daily. In the majority of cases of an inevitable miscarriage the delivery may be left to complete itself by the natural forces unless the hemorrhage be excessive. If the hemorrhage is excessive, then use the tampon; it stops the hemorrhage, stimulates uterine contractions, and promotes complete separation of the ovum from the uterus.

Before using the tampon, be sure to empty the bladder and the rectum. When removing the tampon, be careful not to rupture the membranes. If can not easily pass the finger around the ovum, replace another tampon. The after-treatment is rest, as after full term. In cases of miscarriage when the fetus has been expelled and the miscarriage is incomplete, the whole or a portion of the placenta remaining, it is advisable to at once proceed to clean out the uterus by the use of the curette.

Sometimes you can remove an adherent placenta with the finger, but there is the thickened decidua which almost invariably remains behind in the early miscarriages; this can not be gotten with the finger, so there is nothing better than the curette to remove this condition. If you are unable to remove a retained placenta or parts of one with the finger, and circumstances are such that the curette can not be used, then you will have to resort to the use of the tampon and trust to nature to rid itself of the offending contents. Before using the cotton tampon, or if use the gauze tampon, it is advisable to introduce a strip of gauze just within the internal os and then pack the cervical canal; this is more liable to bring on uterine contractions and expulsion than just using the vaginal tampon.

In conclusion, I wish to emphasize that a curettment in these cases should be considered a major operation, and as great care should be exercised as in making an abdominal section.

THE PUERPERIUM.

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The puerperium covers the time from the completion of labor until the womb has undergone complete involution, the normal period being from four to six weeks. It is a state that has no parallel in human life; "though it is called physiological, it borders so closely on the pathological, very little is required to pass the boundary line into disease." "This is the period in the history of the child-beâring woman that is most beset with difficulties and dangers, and most likely to be marked by accidents and complications. The preventive and curative treatment of these complications depends to a great extent upon a thorough knowledge of the natural processes, for only on such knowledge can one base a rational management of the normal case and a satisfactory treatment of the abnormal conditions which are so apt to develop during the puerperium."

The duty of the accoucheur in the normal puerperium is mainly that of "masterly inactivity"; to be alert and watchful, and ready to cope with any complications, but with especial care to avoid meddlesomeness. It is a common observation of practitioners, that those who are least able to afford the refinements of care and nursing are often more fortunate in their "getting up" from confinements than are their more unfortunate sisters, whose wealth can secure for them the most elaborate and up-to-date attentions. This is neither luck nor chance, but rather the silver lining to the financial cloud that deprives them of the high-priced attentions that too often might be termed meddlesome.

It goes without saying, that the management of the case after labor will be determined to some extent by the nature of the labor, and by the care and skill with which it was conducted. Normal women have normal labors, and the puerperium will be normal if not interfered with. That obstetrician who conducts his cases of labor upon the aseptic plan with especial reference to himself, his instruments, and his nurse, and who recognizes labor as a physiological process, will have little to fear and less to do during the puerperium. If meddlesomeness during labor is bad, it certainly is no better during the lying-in.

The management of the normal puerperium may be briefly summed up in a few paragraphs. No medicine except the usual purgative on the third day is necessary. Bedding, clothing, and external genitalia must be kept absolutely clean. Advise a light, unstimulating but nutritious diet during the first five days; afterwards let it be more varied and generous. Rest, quiet, and sleep are essential. Patient should be confined to bed from nine to fourteen days, resuming ordinary duties after thirty or forty days. There is no advantage in requiring the woman to lie upon her back for a week after delivery, but restfulness and improved drainage will be obtained by allowing her to lie upon either side. The infant should be taught to nurse during the first two days. Afterwards a systematic plan should be adopted and strictly enforced. The patient should have seclusion and protection from well-meaning but unwise advisers. Next to having a bad doctor and a bad nurse, I know of nothing productive of more unhappiness, discomfort, and frequently actual illness in the young mother and her infant than the promiscuous and too often vicious advice of these well-meaning but ignorant friends.

Close attention should be given to the function of the bladder. It is generally advisable to use the bed-pan, but should this be attended with any considerable difficulty, as is not infrequently the case, the catheter should be used or the patient should be lifted onto the commode. Unless there be some especial reason why, it is generally preferable to allow the woman to sit up to void urine rather than resort to the catheter. Should the latter become necessary, then its use should be surrounded with every aseptic precaution.

The first danger to be apprehended in the recently delivered woman is hemorrhage. When the after-birth has been properly delivered, it is remarkable how seldom this accident occurs. In a limited experience of twenty-two years, I have met with serious post-partum hemorrhage only a few times, and in nearly every instance it was due to avoidable cause. The routine practice of giving ergot after labor is unnecessary, because in the vast majority of cases it will not be needed. When, however, there is a history of previous post-partum hemorrhage, or the labor has been very long and the use of chloroform free, or when the labor has been precipitous, or when there is a general flabbiness of muscular tissue, or any other good reason to apprehend hemorrhage, then a prophylactic dose of ergot should be given, and a constant watch over the uterus should be maintained for some hours. Not in-

kind of treatment. A very foul lochia, due to decomposing blood-clot or retained secundines, especially if accompanied by symptoms of constitutional infection; a sinus discharging pus into the vagina or womb; a purulent leucorrhea present before and during labor; these and such like constitute positive indications for the use of the douche during the puerperium.

What has been said referring to the douche is emphasized with even more force in regard to the curette. This is an instrument that has an exceedingly narrow field of usefulness in obstetric practice.

The abdominal binder, after labor is completed and the bedding and clothing changed, is a source of comfort to the patient. It gives support to the relaxed abdominal walls and stimulates the uterus to contract and to remain contracted. A compress may be inserted underneath the bandage if hemorrhage has occurred or is threatened. It should not be drawn so tightly as to depress or retrovert the non-involuted womb.

The care of the nipples and breasts, anticipating and preventing erosions, fissures, and mastitis, is one of the most perplexing and troublesome incidents of the puerperium. The prevention of this very painful and troublesome complication is a thing much to be desired. A faithful trial of reputed remedies leaves the question still in doubt—doubt amounting almost to the conviction that all methods are uncertain and generally fruitless. The ointments appear to soften the nipple covering, making erosions and maceration more liable; the astringents appear to render the covering more prone to fissure and crack. The conclusion from such premises is that probably the wisest course to pursue is to leave the nipples alone until the regular and systematic method of nursing can be adopted, then to keep the nipple free from the drop or two of milk that remains after nursing by bathing it with a solution of boracic acid after each application of the infant.

A word as to the so-called milk fever. That a purely physiological process should result in the development of fever is hard to conceive. The elevation of temperature so often seen on the second or third day coincident with the establishment of lactation is more rationally accounted for upon the hypothesis that it is of septic origin. So also are we inclined to believe that many of the cases of malaria and typhoid fever following labor are caused by the strepto- and staphy-

lococci rather than by the plasmodium of Lavaran or the bacilli of Eberth.

The general tone of this paper may seem to be iconoclastic, but the impression I desire to make is that we should take advantage of every real advance or improvement of modern days, but not to go astray in our endeavor to improve on nature's way; that we be fully alive to the prevention of trouble, but also to refrain from meddlesomeness.

INSTRUMENTAL AND OPERATIVE OBSTETRICS.

ARTHUR T. M'CORMACK, A. B., A. M., M. D.

BOWLING GREEN.

I feel that the Society will pardon the natural timidity of a young man in dealing with this subject—one of the broadest and most important in the whole range of our duties as doctors; and if your essayist falls short in an attempt to briefly outline our duty in those too frequent cases of labor which call for operative interference, he trusts that a part of the blame, at least, will be attached to the honorable Committee on Topics, which has assigned him this task.

Beyond question our most important duty as the guardians of childbirth is the preventing of instrumental and operative obstetrics; and it is here, physicians of Kentucky, that our neglect of our patients is most patent and most alarming. It is no sufficient answer to this indictment to say that pregnant women only call on medical men when labor begins, and that this is too late to ward off many of the more serious conditions concomitant with labor The ignorance, stinginess, poverty, or mock modesty of husbands and wives may be pleaded as extenuating circumstances, but the burden of the charge is on us doctors, and it is to our indecision, lack of knowledge, or neglect that most of the faults of our patients are due. Every woman pregnant for the first time should be examined at least once a month during her pregnancy. After the third month a quantitive estimation of urea should be made monthly, and after any marked diminution in daily quantity, this should be repeated much oftener. Within the limit of the first three visits the external diameters of the pelvis should be measured accurately and recorded. These measurements should be

confirmed at some subsequent time before the sixth month, and the internal conjugate should be worked out by some such table as the excellent one prepared by Dr. P. A. Harris.* In case marked deviation from the normal condition seems indicated, the patient should be anesthetized and the conjugate accurately measured. While actual labor is the only absolute test of the sufficiency of pelvic diameters, much is to be gained by a foreknowledge of their measurements. At times, when they are entirely out of proportion, owing to a small head labor progresses naturally to its termination, but usually this is not the case; and accurate pelvimetry is an essential to safe obstetric practice.

On the other hand, the writer thinks it is as serious an error to treat every pregnant woman as a "surgical case with pathological possibilities." If your patient's pelvic measurements are all right, and monthly tests show no diminution in the early excretion of urea, the old adage "Meddlesome midwifery is bad" is a whole truth, and our whole duty is to encourage her to the best physical and mental development possible for an approaching labor for which the auguries are all bright.

It is not within the province of this paper to deal with threatened or present eclampsia, nor with the various forms of dystocia, except in so far as operative measures are applicable for their relief.

Premature labor should be induced in those cases of pelvic deformity where the conjugate is three inches or less. The operation should be done between the 240th and 250th day from the cessation of last menstrual period, rather earlier than later. The prognosis for mother and child should be very guarded. For the elective cases, Krause's method, the introduction of a well-oiled bougie, under strict asepsis, through the cervix, and well up between the membranes and the uterine wall, and the subsequent tamponage of the vagina with iodoform or plain sterilized gauze, is usually the most effective and the safest.

Premature labor should also be induced in cases of the pernicious vomiting of pregnancy, before the secondary anemia has progressed too far; in convulsions before labor, or in the presence of a tremendous fall in the percentage of urea which can not be readily corrected; or when the mother's health is in such a state from intercurrent disease that it is hopeless to carry her fetus to term. I may add in this con-

*Am. Gyn. and Obstetrical Journal, August, 1900.

nection that I believe it our plain duty in some eclamptic cases which have recovered and become reimpregnated before the general health is fully re-established, to terminate pregnancy during either the abortive or premature period if there be the slightest threatening symptoms of recurrence of the trouble from the kidneys. Before suggesting to the patient or her family the induction of either abortive or premature labor, except in cases of absolute emergency admitting of no delay, every reputable physician should insist on consultation, not only for its value to the patient but for the protection of his own reputation.

Internal podalic version is probably indicated more frequently than any of the other more serious operative procedures. I am inclined to think that it is the most neglected of them all in practice. In this day of multiplicity of mechanical devices, manual dexterity is seemingly becoming a lost art. This is particularly unfortunate in obstetrics, for version is much easier to perform than either of the operations with which it comes in competition. Dr. Marx, of New York, recently said before the Academy of Medicine: "All positions, good or bad, which persistently remain above the brim, and which are not readily correctible by various measures, should call for an elective version." Add to these practically all cases of placenta previa, and all cases of eclampsia coming on before the head is engaged, as well as all persistent cases of prolapse of the cord. In many of these cases, as well as in a smaller number of those in which high forceps are indicated, the os will have to be dilated artificially. I feel confident that it is always better to do this rapidly, and that the method of election is the introduction of the fingers in succession, giving them a powerful twist on themselves as each one is introduced, after the manner described at about the same time by Marx and Harris. It is well to remember in all cases demanding rapid dilatation of the os and version, that, unless the subsequent delivery be rapid, there is danger of a recontraction of the os, and of much consequent trouble in delivering the aftercoming head. It is of equal or even greater importance that much of the force necessary for the delivery of the child be made *a tergo* by pressure over the fundus, and that the legs be used but little as a tractor, but more as a handle to guide the body and head. In dorso-anterior positions the near foot should be seized and pulled down; in dorso-posterior positions, the remote foot. In the harder cases little time should be wasted seeking this or that foot, but the one with which your hand comes in contact soonest should be extracted first.

Forceps should very rarely, if ever, be applied before the head is engaged. This should only be done when some emergency demands a rapid delivery, where the head is proportionately small, with a fully dilatable os. The application of high forceps is probably the most difficult obstetric operation, but it is shorn of much of its danger to the mother by the method of rapid and complete dilatation of the os above mentioned. Its greatest danger to the child is from the necessarily prolonged compression of the head when traction is made. This is obviated to a certain extent by intermittent tractions, loosening the blades between each pull. It is almost entirely obviated by the use of axis traction forceps, but in the use of the latter one must remember to keep the handle near the handle of the forceps when making traction, and not pull down away from the handle, but the traction handle should not actually touch the forceps.

There may be cases in which an elective symphysiotomy is indicated, but I feel satisfied it should never be done as an emergency operation. Where a pubic separation of two and a half inches will sufficiently increase the diameter to permit the birth of a healthy child, this operation may be done, but the writer believes it is an unsafe procedure, unscientific, and frequently followed by conditions much more horrible than death itself. In a certain percentage of cases the child is lost, and the mother, if she recovers, has submitted herself to a convalescence almost every moment of which may be torture.

Cæsarean section, on the other hand, in cases of dystocia due either to malformation of the pelvis or a clean tumor low down, blocking either brim or outlet, has been shorn of most of its dangers in this age of surgical cleanliness, provided resort is had to it before prolonged labor pains have exhausted the mother, and provided further, always, that the child is in good or at least fair condition. Neither uterus, ovaries, nor tubes should be removed at the time of the operation unless diseased, or unless the deformity is so great that further conception should be prevented. Practically the Porro operation adds but little to the danger of Cæsarean section, and it should always be resorted to if diseased condition warrants it. In this case any healthy ovarian tissue should be allowed to remain *in situ* in order to prevent premature climacteric with resulting neurotic disturbances. Clinically it is important to remember that a rise of pulse and temperature is frequently noted on the second or third day following marked contraction of the os and retained secretions. This should be provided against by

dilatation of the os from above, the vagina of course having been asepticised prior to operation, or should be corrected by dilatation subsequent to the operation if necessary.

Craniotomy is justifiable only if you are called in so late as to find a dead or dying child, or if the prolonged application of forceps has made the nervous derangement of the child probable, or in the presence of recognized fetal malformation or deformity, or if a more scientific and humane operation be absolutely refused. No more rigid asepsis is demanded in any condition which we meet than in craniotomy, and it is important to watch carefully the mental as well as the local condition of your patient following its performance.

Of course all these remarks are cursory and general in their application. Every obstetric case, as is every woman for that matter, is a study and a law unto itself, and what I have said has failed of its object unless it has impressed upon you the fact that we should undertake to manage no case of obstetrics unless we have sufficient knowledge of the general subject and enough armamentarium and technique for each particular case. In no class of cases is expert consultation more frequently demanded early in the action, or more frequently delayed until too late. Physicians should be blamed much more for delay in these cases, for the knowledge and experience necessary in ordinary cases is easier to acquire than in cases even of appendicitis, ectopic gestation, or strangulated hernia, which latter they see so rarely as to make a little excuse for ignorance of them. When you have a labor case which is not progressing in the correct manner and with ordinary speed, apply the proper remedy if you know it, but have no hesitation in sending for the nearest man who can assist you, and send quickly before your patient and the little life she has worked so hard for nine months past to bring into the world have both succumbed to your procrastination. In all the operative and instrumental procedures to which I have referred in this article, symphysiotomy and some craniotomies excepted, the prognosis for mother and child is good if resort is had to them early, but it grows worse in algebraic proportion with each hour's delay.

Now a word in regard to the so-called minor obstetric operations, such as the introduction of the catheter or of tampons, and the giving of douches, and there are none more important than these minor operations, before discussing perineal and cervical lacerations and their repair. Each of them is so easy and safe, when properly performed,

that it is almost entirely inexcusable to have infection following them. Absolute, unqualified cleanliness is a prerequisite to the performance of these operations, and the man who will examine even a gynecological patient, and much more the one who will resort to any procedure whatever with an obstetric one, without first thoroughly cleansing himself, has no place in the ranks of modern doctors. Men doing obstetric work really ought not to wear hair on their faces, but if desire for personal adornment leads them to do this, they should certainly tie slightly moistened clean gauze over their beards and mustaches before attending even a normal labor. But, above all things, they should *wash their hands.* I do not mean to take a little pan with a dipperful of water and one of these little round cakes of soap and remove the superficial layer of black from your hands, but call for bowl after bowl of water, if running water is not accessible, and if you haven't some good liquid soap in your bag, take sapolio, or better still, old-fashioned lye soap, and scrub your hands and nails and arms until the skin is soft and clean, *really* clean.

The catheter should never be introduced until the vestibule has been thoroughly cleansed, and, without exception, the vulva should be exposed and the instrument passed during direct inspection. Patients should be catheterized prior to all major obstetric operations. This is a matter of so much importance in the prevention of vesico-vaginal fistula that McLane insists that every doctor should keep a catheter tied to each pair of his forceps; after the labor, if the patient is in good condition, she should be allowed to get up and use the commode. This permits the passage of retained clots and detritus. If the labor has been very severe, however, or if a major operation has been performed, or if the perineum is lacerated, the patient should be kept in bed and the water drawn every six or eight hours, under the strictest asepsis possible.

Just here I wish to express unqualified condemnation of the procedure sometimes adopted of the introduction of a vaginal tampon in cases of placenta previa, and allowing it to remain in place until strong labor pains are induced. In addition to causing sepsis, such a procedure weakens and harasses a patient already in enough danger. In the presence of placenta previa the os should be dilated rapidly by the manual method, and internal podalic version should be done as quickly as possible. After such operation, and after all other labors in which the loss of blood exceeds one pint, a pint of hot normal saline solution

should be thrown into the bowels every hour or two until it is no longer retained.

In giving intra-uterine douches, the vulva especially should be carefully cleansed, and the nozzle should be introduced into the os, if possible, without touching the vaginal wall. In threatened post-partum hemorrhage, unless the cervical or uterine artery is torn, a hot vaginal douche will usually control it. Should it fail, immediately give a large douche of a hot 2 per cent solution of acetic acid, or, if this is not available, of one part of good vinegar to five parts of hot water (116° F.) I have never seen this fail to produce a good contraction of the uterus, but it will occasionally have to be repeated once or twice.

Probably no part of obstetrical technique is so important as thorough provision for the repair of lacerations of the cervix and perineum. No operation that we are ever called upon to do is simpler than the repair of an ordinary tear of the cervix, or one of the perineum which does not extend into the sphincter. A doctor is culpable, and should be held so, who does not actually see the genital tract as far as the os uteri after every labor. In the swollen and abraded condition of the parts, touch, however erudite, gives little idea of the true state of affairs. When you are examining your patient immediately post-partum, do not be satisfied, either, with the continuity of the perineal skin, but look well up into the fornices, and be sure that there is no laceration of the vaginal floor at any point.

Should the cervix be lacerated at all, the fresh edges should be thoroughly cleansed of clots and carefully brought together by either interrupted or continuous suture of chromicized catgut. Be especially careful to have mucous surface opposed to mucous surface at the os, so as to keep the canal patulous.

If the vaginal tear extends up into the fornices, the edges should be brought together by sutures of chromic gut running below the bottom of the tear. These should be brought to an inch of the labia, and the perineum itself should be restored by silkworm gut or silk sutures, entering and coming out on the skin and extending deeply behind the tear. Wash out all clots, and do not tie the sutures too tightly or they will cut out. Have the nurse keep the wound as dry as possible. This can probably be done best by dusting it frequently with markasol, as recommended by Goelet. If the tear is a deep one, but does not include the sphincter, it is usually better to put in a few buried sutures of No. 1 chromic gut before introducing the external sutures. If the

tear is through the sphincter but does not extend into the rectum, the retracted edges of the sphincter should be brought out with a tenaculum and carefully united by interrupted sutures of chromicized catgut. The remainder of the tear should be closed as above. If the rectal wall is involved, it should be united by sutures, preferably of iron-dyed silkworm gut, placed close together, passing through all the rectal walls. The torn ends of the sphincter should be coapted very carefully with sutures of buried gut. The external perineal tear should then be united with deep sutures of No. 26 silver wire or of medium silkworm gut. In removing the rectal sutures, which should be done in eight or ten days, Chambers suggests that the patient be put in exaggerated Sims' position and the smallest size Sims' speculum be used to retract the posterior rectal wall, so that the sutures are readily accessible.

Nothing we do is of more importance than these cervical and perineal repairs, and it would be much more creditable to the profession if more of them were done immediately after labor. Years of invalidism would be saved to thousands of women if every doctor insisted that lacerations of genital structures should be repaired immediately upon their discovery.

DISCUSSION ON THE PAPERS OF DRS. SPEIDEL, SLEET, GOSSETT, CECIL, AND McCORMACK.

Dr. TURNER ANDERSON, Louisville: We have listened this afternoon to a very interesting series of papers on obstetrics.

In regard to the first paper, the thoughts advanced by the author I can not but feel that I am heartily in accord with. Antisepsis in obstetrics is of the most vital importance—more important than any thing else. Especially is this true if we bear in mind that it is our duty to prevent these women from sickening or from dying. We must invariably aim to bring about a perfectly healthy and normal puerperium. The best way to do this is to guard against external infection.

More than ten years ago I had the pleasure of making the report on obstetrics before this Society at its Lexington meeting. I read a very short report on antiseptic midwifery. In that report I called attention to the matter of antiseptics. I said then that if the doctor would prepare himself with the most scrupulous cleanliness, and the same care in the management of his obstetrical cases, and subject the nurse to the same requirements that we exact from ourselves and our attendants in doing a laparotomy; if we were careful enough to take proper heed to these antiseptic precautions, the disease known as puerperal fever would soon become

extinct. The thing to do is to carry a bottle of antiseptic tablets with us continually, and to be especially careful that we render our hands perfectly aseptic, as near as is possible, with the bichloride of mercury.

From that time until the present my faith as to the value of antiseptics in midwifery has been continually strengthened, and I agree perfectly with the speakers who say that the man is criminal who is not willing to take the trouble to properly prepare himself in every way possible in order to guard against sepsis in the lying-in chamber.

Dr. Speidel has gone over the ground in a painstaking, careful manner, and great good will come to all concerned if we will but adopt his suggestion.

With reference to Dr. Sleet's paper, he has presented some very interesting and unusual cases. These anomalies occur comparatively frequently in obstetric practice, but the trouble is that we are somewhat lax in recording them. We would know more about these anomalies if we would present them in a paper, and, if possible, the specimens to our local medical society. Dr. Sleet is to be commended for bringing this report before us.

Dr. Gossett has read us an admirable paper, but I do not exactly agree with him that it is necessary to divide abortion into abortions, miscarriage, and premature labor. I thought we had about done away with terms of this character, except when we talk to the laity. If we come out of a house in which we have attended a case of this kind, and meet a woman who is particularly inquisitive, as is often the case, we can tell her that Mrs. X. has had a miscarriage. The term abortion in the minds of the laymen carries criminality with it. I think it simplifies matters to say that a woman has had an abortion when the product of conception is lost prior to the seventh month. If it is lost after viability of the child, we should term it a premature labor.

I was pleased to hear Dr. Cecil's remarks in regard to the curette, and also what Dr. Gossett said. To my mind it is a very serious procedure to curette a uterus after an abortion. It is a surgical operation, and ought to be so recognized. There are a great many dangers which might occur, and which it is not necessary to particularize at present. The curette at the present day has but a limited place in obstetric practice; that is as it should be.

In reference to what Dr. Cecil said in regard to hemorrhage, I recognized that he had wandered away from his subject. He had gone back to the second and third stage of labor. He said one thing, however, that commends itself particularly to me, and that was this: That there were dangers of very grave import in the third stage of labor, one of which is hemorrhage, and that it is ordinarily avoidable. I agree with him in that. I am convinced that it is ordinarily invited by that telegraphic system of delivering the placenta that has become so popular. I refer to what is known as the Crede method, which means nothing more nor less than forcing the placenta out of the uterus within a certain period of time. That is the

"misunderstood Crede method." The "understood Crede method" is to give abundance of time for the retraction of the uterus to take place, for the placenta to become separated by this contraction, and then to assist by compression of the fundus of the uterus, assisting the contractions which come on afterward. It does not mean, then, that we should take hold of the non-contracting uterus and squeeze the placenta out of it. The man who does that will most certainly invite hemorrhage. Time is necessary in the management of the third stage of labor. The old practice of waiting from half an hour to an hour and a half, or even two hours, would be much better before we institute active measures for the removal of the placenta. It would certainly be the safer practice.

I wish to tell Dr. McCormack that I have enjoyed his paper exceedingly. Instrumental and manual assistance becomes necessary in some cases of obstetrics. The obstructions which occur in midwifery practice are quite numerous. The head may be arrested at the superior strait. It may become necessary, when the presentation is not understood, or if the position is not what it should be, to introduce the hand into the uterus in order to determine the position. I tell you, gentlemen, that when we have anesthetized the patient, and have introduced our hand into the uterus for the purpose of diagnosis, the operation of podalic version is the proper procedure. If you put your fingers into the cavity of the uterus for the simple purpose of making a diagnosis, even in a cranial presentation, and I lay special emphasis on that so as not to be misunderstood, I advise the doing of a podalic version. Carry the hand to the fundus of the uterus by careful external and internal manipulation, the two always combined, and then accomplish the version. Podalic version has done away with all necessity for the performance of a craniotomy. It is a lost art and should be revived. Those of us who have used it recognize its great value. We ought always to prefer the hand to any instrument in obstetric practice when it answers the same purpose. An instrument can not possibly take the place of the hand.

There is one point in which I think we must not be active in our midwifery practice. We must be willing to sacrifice our time, our pleasure, and all social engagements before we resort to the use of instruments of any kind in any case. As the doctor said, every case is an individuality. It is not like other cases. There are no two cases in obstetrics alike. The uterus will not act alike in any two women, and we must recognize all of these facts.

There is one point, however, in which I would take issue with the doctor. I do not believe that we should be held as criminal because we do not inspect every thing, beginning at the vulva and going up, exposing the cervix, and looking up the entire vaginal tract. I have never attempted to repair a laceration of the cervix by an immediate operation.

Several years ago Dr. John O'Reilly, of this city, read an article on that subject before the College of Physicians and Surgeons of this city. I do

not know whether he claimed priority, but he certainly did advocate it. He did not favor the immediate repair of cervical tears. I agree with the doctor altogether in what he says in regard to the perineum, no matter whether it is a partial or a complete tear. We should never fail to restore the parts to their natural condition, so that if we perform any subsequent operation we at least have something to build upon. The intermediate operation for the repair of a torn perineum is a procedure which is absolutely unjustifiable.

Dr. JOHN A. LEWIS, Georgetown: I arise not for the purpose of making an extended discussion of these papers, but to commend them. I do not know that I ever listened to better papers. They are all most excellent, and I do not wish to make a distinction in favor of any one of them. Every one of them exhibited the touch of the master hand, and indicated diligent preparation. That is the one thing for you to do when you come before this Society to read a paper. Come prepared. These gentlemen have done that, and I thank them for it. In the discussion which I shall make I may not always refer to the name of the writer in connection with any point that I may make, because it is a little difficult in listening to four or five papers to associate the name of the writer with the point to be discussed.

The first point I wish to make is this, and if you carry nothing else home with you, I hope you will not forget this one point. I want to dignify the importance and the position of the obstetrician. The highest compliment that a woman can pay to a practitioner is to engage him as her accoucheur and admit him into her lying-in chamber. The man who is not ready and willing to devote himself without reserve to the welfare of that woman and that family, and lay aside every other personal consideration so that he may assist her to complete and satisfactory recovery, is not worthy of the name of physician, let alone the name of accoucheur. Gentlemen, when you enter the lying-in chamber, remember that your time belongs to the woman who has honored you. I do not care whether she may require your attention for a day, an hour, or a week. Ever keep this in mind through life; you will oftener meet your disappointments than your appointments, so don't worry.

That physician who is not willing to sacrifice his time and comfort to the welfare of his patient is not worthy to hold the place or wear the name of physician. In the lying-in chamber never be in a hurry. I do not advocate meddlesome midwifery, but the time does come in many cases when the physician must interfere.

I never in my life felt myself so much the man and so completely the physician as when after a hard-fought battle alone, in one of these difficult instrumental cases, I emerged with mother and child safe, resting peacefully with full hopes of recovery before them. Gentlemen, this is the most important branch of our profession, and should elicit our best attention. Do it well or not at all. Above all things (in a word), do it aseptically. If you do, how gratifying and how beautiful will be the results! No man

who practices obstetrics in any other way ought ever to be permitted to enter a lying-in chamber.

Always do this work the very best you can, considering the surroundings, and you will be amply repaid for your trouble.

And now with reference to the repair of the perineum. I look upon the perineum as the most important strip of territory in a woman's anatomy. It is a very narrow strip, and for that reason all the more important. I grant you the ingenuity of plastic surgery does much toward repairing any damage which may have been done. The results are excellent. And yet I must say you can not restore the perineum to its original perfection; therefore, save it if you can. It certainly should be done oftener than it is. You can nearly always foresee the coming danger, and can tell that you are going to have serious trouble in the passage of the head. In these cases I would advise you to bring your patient to the edge of the bed; put her in the exact position in which you would place her if you were going to apply forceps. This position gives you complete control of the head. When the head has been forced down to the point where you are sure of control, then give chloroform freely, press the head firmly toward the pubic arch, and gradually work it out. If you have had to apply the forceps, then so soon as the head is brought to the point of control, hold every thing firm and steady, remove the forceps, apply the chloroform freely, and gradually turn the head out, pressing it firmly upward.

If you will follow this advice you will rarely have a bad result. I do not say that I never have a rupture, but I do say that by adhering to this plan you can avoid a great many tears.

In answer to question from Dr. Gilbert: No; I rarely put my fingers in the rectum to make the upward pressure, as I do not want to have proctitis complicating the purperium; neither do I want to carry septic infection into the genital tract.

The English position on the left side is a good one, and is preferred by many physicians, but I think the lithotomy position is the best, and it offers us the greater advantage in these cases. In cases where rupture of the perineum results, I stitch up the tear immediately, and usually get good results.

In regard to cervical lacerations, I do not believe we ought to meddle in these cases. I would never interfere unless I had hemorrhage resulting from a laceration of the cervix. Then I would bring the cervix in view, and put in a stitch to control the bleeding.

Dr. McCormack has made so many good points in his paper that it would be impossible in my allotted time to discuss them further. In closing, I wish again to compliment him for his most admirable exposition of the subject.

Dr. Frank C. Wilson, Louisville: Unfortunately I was late in coming in, and therefore missed the first papers, but I listened with a great deal of pleasure to the last two papers. There are only two or three points that I

wish to call attention to. Dr. Gossett spoke of the prevention of abortion, but failed to mention one method which I have used in times past with a good deal of benefit. I believe that I have prevented miscarriage and abortion in a number of instances by the use of very small doses of ergotole, or several drops of the fluid extract of ergot. It is useless to argue what effect it has or how it acts. We are told that the first effect of ergot, given in any dose, and the only effect of a small dose, is upon the circular fibers of the uterus, causing them to contract. When the uterus is threatening to rid itself of its contents, when an abortion seems inevitable, if then we can in any way tranquilize that uterus and close the os that is beginning to dilate, we certainly accomplish good. The small doses of ergot will tranquilize the circulation, they will have an effect on the circular fibers of the cervix, to some extent closing the os; and I have seen, in a number of instances, when the ergot is given every hour or half hour, all of the symptoms gradually disappear and the case go on to full term, providing there is no actual separation of the membranes from the uterine wall. I do not know why it is that the ergot acts as it does in these cases, but I can certainly testify to its beneficial effect in a number of instances.

I wish to call attention to another point, that is, the management of obstetric cases; the great assistance of physical diagnosis in the conduct of these cases, aside from the help which it may give the accoucheur or the careful examiner. Examination by external auscultation is of great aid in assisting us in making out the position and presentation of a case, and I was glad that one of the essayists called attention to the importance of examining these cases long before the day of delivery. That is exceedingly important, and should be done all through the case. The determination as to whether the presentation is natural or not is of importance, because it will assist us in the completion of our work. This examination may be made long before the delivery is upon us; long before full term is reached. You can easily ascertain the point where you can hear the heartbeat, and that will tell us almost every thing we want to know. Aside from the auscultation, palpation will aid us in the recognition of the various parts of the fetus through the abdominal wall. If this is done any time before the membranes are ruptured it may be of assistance to us, especially in the transverse presentation. No essayist made any mention of that class of cases. This presentation emphasizes the importance and necessity of physical diagnosis. You can in that way detect many conditions which can be corrected before the membranes rupture, and while the child is floating about in the liquor amnii version may be performed externally in the easiest possible manner, thus saving the mother a dangerous operation. The child's life is also free from danger. If this is not recognized and the version is not performed beforehand, we then have the shoulder presenting, the arms perhaps protruding, and an absolute necessity for the performance of an internal version, which we all know is an exceedingly dangerous procedure for the mother as well as the child. All this can be obviated if an

examination is made prior to the rupture of the membrane, or even better, at the sixth or seventh month of gestation. I think it would be a good rule for every obstetrician to make a physical examination of his case at the seventh month and ascertain whether the presentation is natural or not, what the position is, and, if need be, take proper steps to correct a faulty condition of either.

After the presentation or position is ascertained, after version is performed, the duty of the physician has by no means been done. He will often find that when labor comes on the child has been thrown back into its former position by the uterine contraction. He may not have seen his case in the interim between the performance of the version and the onset of the labor. Of course the faulty position has brought about a faulty development of the uterus. Its shape is faulty, and when the pains commence there are faulty contractions, and the child may be thrown back into its original position unless the physician is at hand to maintain it in its proper position during the first half of the labor. If he does not do this he will find that all his struggle has been for naught. In four or five different cases I have had the satisfaction of being able to convert an unnatural transverse presentation into a vertex presentation, and have seen the labor go on in a normal manner.

Dr. ANDREW G. BLINCOE, Bardstown: The symposium was certainly a very interesting and instructive one. In connection with the treatment of post-partum hemorrhage there were two remedies which I failed to hear mentioned. I want to ask the essayist, in closing his discussion, to tell us whether these remedies are no longer considered valuable. I refer to the introduction of sterilized gauze into the uterus, and to the digital compression of the abdominal aorta. I have heard these remedies very highly recommended, but have never had occasion to use them myself. I would like to have the gentlemen who have used either remedy, or both, tell us what their experience has been, and whether they consider them reliable remedies.

Dr. W. W. RICHMOND, Clinton: I have never heard better papers read before, and wish to compliment the authors. I want to call attention to that portion of Dr. McCormack's paper relating to the perineum. I heartily agree with the gentleman who said that every thing should be done to save the perineum. I remember when I was called upon in a medical society a few years ago to state how many torn perineums I had seen, I said about one or two hundred. A very eminent physician in that society arose and said that he could count the number of torn perineums that he had had in the last forty years upon the fingers of his two hands. The trouble with that gentleman was not that he did not have enough cases, but that he had never looked to see whether or not he had a torn perineum. As Dr. McCormack said, we must not rely on our fingers, because our finger-tips deceive us. We must look and see whether there is any laceration. I remember one of the worst cases of torn perineum I ever had, in which the

skin was intact, but the whole muscle was ruptured down to the rectum; therefore we should lay special stress on making an ocular examination. If we do that we will have fewer lacerations, and consequently less debility in women as the result of a badly repaired perineum.

Dr. WILLIAM H. WATHEN, Louisville: I regret that I did not have the pleasure of hearing any of the papers except that of Dr. McCormack. From the discussions I have gained some idea as to what these papers contain. First, as to abortion: Whether it be an induced abortion or an abortion the result of disease, the uterus should in every instance be cleansed of the secundines before the doctor leaves the patient, with such aseptic precautions as would pertain in a laparotomy. No one knows so well the dangers resulting from neglected obstetric operations as the surgeon who does gynecological work. He constantly traces his cases of pelvic abscesses to neglected operations, where the case was either treated in an uncleanly way, or, which is generally the case, where the physician left the membranes, expecting nature to finally expel them when the patient would recover. By leaving the membranes we incur the danger of hemorrhage, and also the danger of sepsis, which may result in a general sepsis and death, or in a local sepsis confined to the uterus or extending to the broad ligaments, with pus cavities. Finally, we may have pus-tubes. The patient may and generally does escape the primary trouble, but we have to deal with the secondary troubles, removing the ovaries and tubes, opening pus cavities, and even being called on at times to remove the uterus as well as its adnexa.

As to the use of antiseptics in labor, I do not think that antiseptics or douching have any place whatever in obstetric practice, unless we know that there has been septic matter in the genital tract prior to the onset of the labor. I do not believe that any thing should be used either before or after labor. I am of the opinion that every time we use a vaginal douche we take a great risk. We can remove nothing, because there is nothing to remove. On the contrary, we can introduce a great deal, and I am sure it is next to criminal for us to use a bulb syringe that has been used previously. Nature can and does take care of these cases if we do not interfere.

The question of suturing torn structures following labor I listened to with more than usual interest as discussed in the very practical paper of Dr. McCormack. I fully agree with most of what he said, but when it comes to suturing every torn cervix I must differ with him in his treatment. Nearly every cervix is torn more or less in a first labor, but the tear is so insignificant that it is of no material importance, and if let alone the patient will never suffer primary sepsis. When it comes to the perineum, then I think that we ought to sew the tear promptly, providing it is extensive. If in sewing these structures, even in complete involvement of the recto-vaginal wall and of the sphincter, catgut or kangaroo tendon be used, the surfaces will unite perfectly.

Dr. E. S. SMITH, Hodgenville: One of the essayists recommended the use of a normal salt solution in the treatment of post-partum hemorrhages. Owing to the recent discovery of the hemostatic properties of gelatin, I think it would be well to add a 2 per cent solution of gelatin to the normal salt solution. At the same time the gelatin can be used locally in the shape of a douche. If the gelatin has the effect which is ascribed to it, it is an invaluable remedy in the treatment of these cases of severe post-partum hemorrhage.

Dr. J. L. ATKINSON, Campbellsville: I want to commend Dr. Gossett's classification of miscarriage and premature delivery. The word abortion has always grated on my ear, and I feel it does on nearly every ear. I think it should only be applied to those cases where the emptying of the uterus is induced. This may not be according to the authorities on the subject, but it is certainly more esthetic. Dr. McCormack did not mention those cases of torn perineum in which the vulva is very much swollen. Where this has occurred, it has been my custom to do nothing at all for the first twenty-four or even forty-eight hours except to keep the parts perfectly clean, and applying hot applications for the purpose of reducing the swelling. When this has been accomplished I repair the perineum. My results have been most gratifying, much more so than they would have been if I had attempted an immediate repair while the vulva was still swollen.

Dr. J. A. FREEMAN, Beard: I would like to know why some of the gentlemen present object so much to the use of the curette, and I would like to ask them what they do when the uterus is relaxed, with the membranes hanging out of the os, with a foul discharge, and perhaps chills and fever? What would be their method of procedure in those cases?

Dr. T. B. GREENLEY, Meadow Lawn: I only wish to say a word or two in regard to the use of normal salt solution in hemorrhages resulting from abortion. About eighteen months ago I had two cases where I am certain that I saved life by the use of that solution. When I entered the room where the patient was I thought she was dead. She was as pale as a corpse. I put my hand on her wrist, but could not perceive the pulse beat. I opened her eyes and saw that she was still alive. She had had a miscarriage at about the third month, and had bled profusely. I immediately gave her a hypodermic of nitro-glycerin, and then injected nearly a gallon of salt solution per rectum, holding it there for nearly an hour. Her color gradually returned, her pulse slowly increased in volume and frequency, and within a short time afterward she was comparatively well. I then put her on ergot, and no more bleeding occurred.

Two or three weeks afterward I was called to see another case of miscarriage at about the fourth month. They said the lady was bleeding to death. I could barely feel her pulse, which was very rapid and weak. I saw a great pool of blood under the bed, it having soaked through the mattress. I used the same treatment it this case as in the previous one, and soon checked

the trouble. In addition to that I was obliged to clean out the uterus, which was full of clots of blood. The first case was so nearly dead that I was afraid to go into the uterus, but as the abortion was in the early months I took it for granted that the membranes had all been expelled. Both cases got well. It is astonishing how rapidly the colon and sigmoid flexure will take up solutions when the blood-vessels are thoroughly emptied. I was never so gratified in the use of any treatment as I was in these two instances. I felt at that time, and still feel, that the salt solution saved the lives of these two women.

Dr. ANDREW SARGENT, Hopkinsville: I was not fortunate enough to hear the first two papers, and must therefore limit my discussion to the three which I heard. I feel very grateful to Dr. McCormack for calling our attention to what might be called another stage in the management of labor. The fourth stage is really the first one, the preliminary management of our cases of obstetrics. I do not see exactly just how Dr. McCormack can get his patients to send for him months in advance of the confinement. Furthermore, I do not understand how he is going to make a monthly examination of the urine; how he is going to get sufficient correct data from which to make a diagnosis of pathological conditions at the proper time. I hope he will bring this out in his closing remarks.

I believe that in obstetrics time is the most important element, and every physician should instruct his patients to send for him at the very earliest indication of labor. He should be there, if possible, before labor begins; then he should take charge of his patient and make the necessary preparation. He must take time to stay with that patient until the labor has been completed and every indication of further trouble is removed. I believe that the majority of the pathological conditions following the physiological process of labor are the result of too much interference. I believe that you will very seldom meet with pathological results if you have a little patience and take time in which to give nature the very fullest opportunity of carrying out this process.

As to mastitis, I was raised on a farm and frequently observed that if there was an inflammation of a portion of the cow's udder the young did not suckle from the inflamed part, and the damage was soon repaired and function restored. I believe the same applies to the human. We must stop the flow of milk on the affected side, and, if necessary, stop it in both breasts.

I was very glad to hear so much stress laid on asepsis and antisepsis, as I am convinced that cleanliness is the key to success in this line of work.

Dr. CARL WEIDNER, Louisville: I have had some cases of obstetrics in the course of my life, but in listening to these very able papers I can not help but think that I, and many of the gentlemen present, must have sinned very greatly against the proposed methods brought out to-day. Time, as has been correctly stated by all of the speakers, and I endorse them most heartily, is most necessary in delivering a woman. We know

that in time nature will deliver a woman normally. I know that many of us are in a hurry to get away from a case, and we ought to be honest and acknowledge it. This is especially true in the third stage of labor. I will say that I have always followed this out conscientiously, a teacher of mine having impressed that fact very firmly on me. I do not see why we should be in any hurry about removing the placenta. Not only one or two, but from six to ten, or even twelve hours should be given the placenta before forcibly removing it. We do not have to interfere. Of course, it is not necessary for us to stay there, but we should see that some one competent to do so takes our place when we have to go. It is not necessary to introduce the hand into the uterus. It is unjustifiable. The best method to determine whether the uterus has been completely emptied is to examine the placenta. This should be done in every instance, and it should be impressed on every obstetrician. No matter whether expressed by Crede's method or by waiting, the placenta should be thoroughly examined to see that every thing is there. Not only the membranes, but carefully examine the attached surface of the placenta to see that it is smooth; there must be no crevices or defect of any kind. When you find it all there you can be sure that your patient will get well.

In regard to the ergot, I would like to say that I suppose most of us have discarded it almost entirely. I would like to know from those who have done much of this work whether hydrastis will not replace ergot very materially. It arrests hemorrhages ordinarily, and ought to be good in these cases of uterine hemorrhage.

Another method is the use of suprarenal extract. If suprarenal extract is as good as it is said to be, I do not see why we should not use it in these cases of uterine hemorrhage.

There is one point on which I want to go on record as being against the other gentlemen, and that is the use of the douche post-partum. We have been told repeatedly that we ought to scrub and sterilize our hands and arms as well as the patient very thoroughly, so as to have proper asepsis. I do not see any reason why we should not use the post-partum douche. I think the objection to the douche can be overcome. Dr. Wathen has correctly stated that an old syringe is a bad thing to use. Then let us have a new syringe. We use syringes in the operating-room; why not, then, at the bedside? Although the vaginal secretions are natural protectors against infection, we must not forget that we have a disturbed relation here, more or less congestion, and the entrance of air as well as our hands carries a certain amount of danger with it. I see no harm in the post-partum douche. I have used it for twenty years in the practice of midwifery. Freund used it in ten thousand cases with only two infections, and those were due to carelessness on the part of the students.

The total closure of the common duct in an infant, as related by Dr. Sleet, is certainly very interesting. I am astonished that the child did not die in utero.

Dr. HENRY E. TULEY, Louisville: I wish to mention a few points as they occurred to me during the reading of the papers. As regards the time of the third stage of labor, it seems to me that the advice to wait six or eight or ten hours for the uterus to expel the placenta is bad teaching. I do not think that we should wait longer than an hour. I would put that as the limit. It has been my habit to deliver the placenta by the Crede method after a good, firm uterine contraction at the end of half an hour. I have never had any trouble from expelling the placenta in that way. I believe I have heard Dr. Turner Anderson say a number of times that a contracted uterus emptied of its contents can not lead to any danger. As long as the placenta is in it is a source of danger.

We must above all things be clean. We ought to prepare our hands aseptically, using mechanical methods, brush, soap, nail-file, and plenty of water, and not rely on the use of antiseptics to cleanse our hands. It is asepsis and not antisepsis that we want to use.

Dr. LEAVELL, Louisville: It seems to me that there is no more important question in obstetrics to-day than that of cleanliness. In connection with the production of mastitis, we should bear in mind that a great many of these cases are induced by the nursing infant, who, in his effort to get nourishment, injures the nipple to some extent. After that a little of the milk collects in the bottom of these crypts and grooves, where it promptly undergoes decomposition and sets up an inflammation, which is carried on further by the lymphatics.

In regard to the fever mentioned by Dr. Cecil, I think that we very often find an elevation of temperature which is not septic. We see a great many cases where labor has been prolonged in which there is some slight elevation of temperature, perhaps not over a half of one degree, immediately after the delivery of the child. I have noticed it in one or two cases after instrumental delivery, where labor was prolonged for twenty-four hours in one case and for twenty-eight hours in another. The temperature varied from 103° to 104° F. I believe this is due to an increase in the metabolic processes brought about after the birth of a child, and not to sepsis. Of course we must always bear in mind that in a great number of instances it is due to sepsis. We should always be ready to cope with this condition, but we must not in every case imagine that a little temperature denotes a septic process.

In regard to the use of ergot, Dr. Turner Anderson sounded a key-note several years ago when he said a contracted uterus could not bleed. Dr. Tuley went a little farther when he said that the uterus should first be relieved of its contents. I believe ergot should never be used, as it is very liable to bring on nausea and vomiting.

In regard to the use of chloroform, it is primarily a vaso-motor constrictor, and secondly a dilator. If the chloroform is given early, before the head impinges on the perineum, we are liable to produce a dilatation, and thus cause a post-partum hemorrhage.

Dr. W. B. DOHERTY, Louisville: The question of asepsis is an exceedingly important one in the practice of obstetrics. When we take into consideration the fact that so many physicians in this city who practice among colored people and others who are not clean, do not meet with puerperal fever, we must come to the conclusion that perhaps the principal factor in the production of puerperal fever is pus from without, hence I feel that the handler of pus has absolutely no business in the obstetrical chamber. I believe that strong lines should be drawn, and that the gentlemen in our profession who are extensively engaged in gynecological work should not engage in obstetrical. Undoubtedly puerperal fever is caused not from an auto-intoxication, but from pus from without. It seems to me that I am justified in this assertion. As a rule we do not find so much puerperal fever outside of the hospitals, therefore physicians who practice a great deal in the hospital and are engaged in surgical work see many of these cases.

While I believe that absolute cleanliness is necessary, yet I do not believe that a man need go to deliver a woman and dress antiseptically, nor shave his beard or mustache, nor be bald-headed, nor shave the hair off his arms. I do believe he should have clean hands when he delivers a woman.

Dr. Gossett has recommended the curette to us. Dr. Anderson said it should be used with a great deal of caution. Some of the other gentlemen say we should never use it. It is an exceedingly dangerous thing to curette a uterus, and not many practitioners are qualified to do this work. When we take into consideration that the uterine walls are very thin (about one sixteenth of an inch in thickness at this time), we can see how easy it is to produce a rupture of the uterus with a curette. A sharp curette should never be used except in the hands of a master workman. The blunt curette should, of course, be used rarely.

There are some things in Dr. Cecil's paper that I commend because of his conservatism. However, I do not believe that a woman should be kept in bed for ten or fourteen days. I do not see the necessity of it unless there has been a very prolonged and tedious labor. They get along much better when they are not kept in bed for so long a time. I do believe that a bandage should be worn during the first two or three weeks because of the danger of dislocation of the uterus by moving around, as the uterus does not have enough support from the abdominal walls. It is better to use the bandage after the woman gets up rather than while she is in bed.

I disagree with Dr. McCormack in reference to the use of the traction forceps when the head is at the brim. I believe the tendency now is to bring about podalic version rather than introduce the forceps and not know what you are doing. It is a very serious matter to introduce forceps at the brim. How many of us are qualified to do this work? It is a difficult procedure, because you do not know the position of the child, and you are

going at it blindly. In these cases podalic version is much the safer route and better procedure.

In reference to craniotomy, that is obsolete. There is no man nowadays who would perform craniotomy on a living child. We are not justified in this age of progress to perform the operation of craniotomy. Of course if the child is dead it is a different matter.

Dr. G. G. THORNTON, Gravel Switch: In common with the other speakers who have discussed the papers, I wish to compliment the essayists, and will say that the points were mostly well taken, and with most of them I heartily agree. There is one point, however, about which I would like to make inquiry. Much has been said in regard to post-partum hemorrhage, about the methods of preventing it, and about the methods of curing it. I would like to know whether there is any one here who has ever lost a case from post-partum hemorrhage? Neither the men who have read the papers nor those who have discussed have reported a case of post-partum hemorrhage which resulted fatally. I have had some very serious cases of this kind, but fortunately I have never lost any.

Dr. R. B. GILBERT, Louisville: There is one point that ought to have been more thoroughly discussed, and that is the matter of sewing up a lacerated cervix. A few months ago I attempted it in a case where I had reason to believe that there was a laceration. With a large speculum I opened up the vagina, and the cervix looked exactly like a large rosette. I did not know where to begin to sew. It was very badly torn, and I abandoned the job of sewing it up. I repaired the peritoneum, however. Three months afterward I had occasion to examine the case again, and was surprised to find only a very little tear in the cervix, one which would do absolutely no harm. I do not believe it is possible to sew up these badly lacerated cervices.

In regard to puerperal fever, I believe that the vast majority of cases are due to infection present in the uterus. Dr. Doherty has mentioned how many women live in dirty houses and never get puerperal fever; places where the conditions for its development are most favorable. I believe that the majority of cases of puerperal fever that I have seen were due to gonorrheal infection in the patient herself and existing before the labor began. An old tube, which was diseased, may possibly rupture during the process of labor, but I do not believe that more than ordinary cleanliness need be observed. We are too apt to go to extremes.

Dr. T. D. WILLIAMS, Bardstown: I would like to ask the members of this Society whether they have ever known bleeding of the uterine walls to be a cause of abortion? I have not heard the point brought out, but it has occurred to me that it is possible. As regards the rise of fever after confinement, I regard that as being due to the shock caused by the labor. Very frequently we have a patient getting a fall or injury which is followed by an ephemeral fever. I think it is due to shock. Some women suffer more from shock during a confinement than others, and therefore have more fever. We must not lose sight of the fact, however, that the fever may be due to an infection.

Dr. SPEIDEL (closing the discussion): In my paper I advocated asepsis, and antisepsis, it seems, has been taken for granted by some of the speakers. The only two antiseptics I use are the boric acid for the eyes and the sterilized cord for the umbilical cord. The lysol is only used to keep the hands aseptic. When making an examination, the hand naturally comes in contact with the vaginal mucus, which can be readily removed by shaking the hand in a lysol solution, then in a normal salt solution or a hot saline solution. In the paper I advocated especially the use of the small package which I showed you in connection with the paper. I, like so many other practitioners with whom I have spoken on the subject, used in the early days of my practice a large, cumbersome, elaborately constructed obstetrical bag. I used to drag this big satchel to all my labor cases until I finally found that I needed only a few articles of the many I carried with me. Now, instead of dragging this big satchel, many practitioners attend labor cases without dragging any thing at all with them. My outfit is exceedingly simple, but it is clean. It contains only a few things which are absolutely necessary in the conduct of an ordinary case, but those few things are absolutely aseptic.

The aseptic details can be very easily carried out in the lying-in chamber by means of the two articles carried in my box. It can be gotten ready by any one who possesses a list of the articles it contains. Any pasteboard box will answer the purpose. After the package has been used, simply replace the gauze used by another package, and you are ready for your next case. You can pick this up in a moment, and the necessary preparations for your case are made during the time in which you are inactive.

I mentioned ergot as one of the ingredients of this bag. I use an aseptic ergot contained in bottles resembling dipththeria antitoxin; that ergot can be used either hypodermatically or per orem. I fill the hypodermic with ergot so as to have it ready in case urgent need should rise for its use. I do not believe that it is necessary to use ergot in the third stage if the uterus is perfectly empty and contracting firmly. After having delivered the placenta and before I leave the patient I manipulate the uterus once more so as to induce it to contract for the purpose of removing any blood-clots which may have accumulated in its cavity since the expulsion of the placenta. I do not believe that ergot is at all necessary in any ordinary case.

Dr. GOSSETT (closing the discussion): I believe Dr. Anderson misunderstood me in my classification of miscarriage. The first classification I gave was that given by most authorities, who classify miscarriage as an abortion when occurring before the third month, a miscarriage when occurring from the third to the seventh month, and a premature labor if it occurs after the seventh month. The classification which I gave was miscarriage and premature birth, omitting abortion altogether. If we have an expulsion of the contents of the uterus at the second month, and when it is not produced by any criminal procedure, call it a miscarriage at the second month.

Use the abortion only when you know that the expulsion is due to a criminal procedure.

I was very much interested in Dr. Sleet's report of cases, and in this connection I wish to mention a case which I had in my obstetrical practice about six years ago. It was a most peculiar condition, and one which I had never heard of at that time. I saw it in consultation with an old physician. Owing to the peculiar color of the child's skin, we determined to call it "blue disease." Three days after delivery the child was perfectly healthy, and then suddenly began to turn blue. Inside of two days the blue color had changed to a decided blue-black, about as dark as the skin of a negro. Within six weeks the color gradually lessened in intensity, and the child ultimately regained perfect health. This condition is due to the failure to close of the foramen ovale. It is a comparatively rare condition.

Dr. Cecil says it is not necessary to use ergot after every case of labor. Dr. Speidel says he uses it, but at the same time made excuses for doing so. I do not believe any harm can be done by using ergot at the end of the third stage of labor after every thing has passed away. If any of you can show me where any harm can result from its use, I will stop using it immediately. I am convinced that a great deal of good may come from using it, especially if it brings on tonic contractions of the uterus. There is absolutely no danger that the uterus will relax again. A good contracting uterus will not relax. I know one case where a physician, whose routine practice it was to give ergot in every case, found the uterus contracted so nicely and firmly that he did not give the ergot. He stayed with the case for an hour and then went home. About two hours afterward he was sent for in a hurry. When he arrived he found the vagina full of blood and the uterus nearly as large as it was before the labor began. He now honestly believes that if he had given ergot he would not have had this condition resulting.

One point in connection with Dr. Speidel's paper: In the prolonged second stage of labor you will sometimes find that the anterior lip of the uterus is edematous. On this the occiput of the child is caught so that it can not descend as it should. During the interval between the pains shove the anterior lip of the cervix up from the presenting part and hold it there during the traction, and until the descending part has passed the lip.

Much has been said about the repair of the perineum, but not much about guarding against rupture of the perineum. We ought to do all we can to prevent such rupture, but unfortunately not enough attention is paid to it because the practitioner feels that it can be repaired. Take, for instance, where you have the occiput presenting and you do not want the second stage to be a long and slow stage—after the occiput has rotated toward the front, and when you have extension of the head, you want the back of the neck to fit closely against the symphysis pubes; have good flexion, and when you get to that point when the back of the neck gets up under the symphysis, then let us have a gradual extension so as to roll out

the forehead and then the face. Many obstetricians put their hands on the perineum and press it up firmly against the on-coming head. Do not touch the perineum, but keep the forehead from coming down too quickly and using too much force, and try to have the perineum distended gradually. If the second half of the second stage be a long one it will distend the perineum slowly but well, and you will rarely ever have it ruptured. It is extremely elastic and permits of much distension, providing the distending force is not applied too suddenly. Therefore, direct your attention to the presenting part and do not let it rush down on the perineum, because you will always have a rupture.

Dr. CECIL (closing the discussion): I wish to thank you all for the very kind reception you have given my paper. During the preparation of it I was very much disgusted with it, and finally came to the conclusion that it was hardly worth presenting to you, but your kind reception leads me to believe that there may have been something in it after all. There are one or two things, however, that I would like to refer to. First, in regard to the use of ergot after the labor is completed as a preventive measure against hemorrhage. In my paper I advocated the use of ergot in all cases where we had reason to fear a hemorrhage. I believe in ergot, and especially when it is used in the manner suggested by Dr. Speidel. I know that in ergot we have a good remedy. I do use it, and I always carry it or have it at the house ready for use. The point I make is that I do not use it as a routine practice, because I do not see any necessity for it. Perhaps no harm can come from giving it, but where in the world is the good of giving medicines when you do not need them. Ergot is not a very acceptable drug for the stomach, because it is extremely apt to produce nausea. There are a good many things that we could give in any condition if the only reason for giving them is that they produce no harm. Most women are able to tell when they are going to have a hemorrhage. I think it is possible to foretell it almost every time. In all cases where we suspect a hemorrhage, we should give a dose of ergot immediately after the delivery of the placenta.

The point was raised in regard to fevers after labor. In my paper I took the ground that practically all fevers were due to some form of sepsis. It is true that there is a fever which comes on in nearly every case of labor which is due to the shock produced by the surgical aspect of the case. That is not necessarily a septic fever, as it nearly always develops on the second day. We need not regard it as we would a septic fever. It requires absolutely no attention, as it disappears without any treatment whatever.

My good friend, Dr. Weidner, whose opinion I regard very highly, says he has used the post-partum douche for twenty years, and that he has never had occasion to regret it. I myself have used the post-partum douche after labor, and also the intra-uterine douche, and in a few instances with decided advantage. I do not object to that, but I do object to the routine practice of using it, and that is the only difference between Dr. Weidner and myself.

I have the same objection to the douche as I have to the use of ergot; it is not necessary, and as Dr. Wathen and others have mentioned, we run the risk of introducing poison into the genital tract from outside sources, which does not occur when we have a clean delivery, and when we do not use the douche. Furthermore, I believe that the douche, as a routine procedure, disturbs the normal bacteriological condition of things. I think it has been proven beyond doubt that the friendly bacteria residing in the vagina are fully capable of taking care of themselves and the woman in most instances. By using the post-partum douche we not only run the risk of carrying germs into the vagina, but we run the risk of destroying all those that are friendly to our cause. Moreover, I think the strongest argument against the use of the post-partum douche is the fact cited by many speakers, that so many women in the lower walks of life, who never had such a thing as a vaginal syringe, who never get any such attention from their doctors or nurses and yet get along beautifully, get up promptly and get up well. I think that is the strongest argument against any routine practice of this kind.

With regard to the cervical tear, like most of the speakers to-day I do not believe it is feasible. I have seen cases in which especially precipitous labors in primiparous women were almost sure to have laceration of the cervix. I do not believe it is feasible to attempt to repair the cervix at that time, because it is impossible to tell the exact extent of the injury. There may be only one tear, there may be four or five tears, or a stellate tear, and it seems to me that it is extremely difficult to undertake the repair of those lacerations immediately after the completion of the labor. I think it is much better to wait until nature has had a chance to repair these tears. We can always sew them up later on if the natural repair is not complete.

Another thing I was very much interested in, one which has occasioned me about as much concern and unhappiness as any thing I have ever had to do with, and that is the question of the management of pernicious vomiting. It has been my misfortune to have cases where vomiting has been most severe, and, in fact, fatal. Dr. McCormack advocates the practice of inducing miscarriage, in order to stop the vomiting, at the point where the patient has become anemic. If the value of that procedure can be established, it will be a source of great comfort to me. I have no scruples against inducing abortion in order to save the woman's life, which is what it would mean in these cases of pernicious vomiting. I would like to know exactly at what time the labor should be induced, and hope that Dr. McCormack in his closing remarks will refer to this matter.

Dr. McCormack (closing the discussion): I desire to thank all the gentlemen who have discussed my paper, as well as those who have honored me by assigning me a place in this very excellent symposium. I especially wish to thank those gentlemen who have seen fit to criticise the essayists, because that is the only way in which we young men can learn whether we are progressing wrongly or rightly.

With regard to those gentlemen who do not agree with me in the matter of the immediate repair after labor of a torn cervix, I have noticed that only one of them said he has seen a torn cervix. The others have merely given us their opinion as to what they think had better be done in such a case. Any man who has not seen and repaired a tear immediately after labor has absolutely no right to an opinion. A large part of my income is derived from the repair of crevices of women who have been neglected by just such men as criticized me here this afternoon. Therefore, it is not for any mercenary purpose or motive that I make the statements which I did in my paper. I want you to repair these cases of torn cervix yourself. If you do this it will be a loss to me, but I feel that any man who will be content to merely look at a torn cervix and waste time by deciding whether or not it should be repaired, ought to stop practicing medicine and be a lawyer.

Ergot should be used in all case where post-partum hemorrhage is threatened, and when the doctor does not know what else to do. It is a great thing to feel, if your patient dies, that you have at least done something. In all these cases ergot should be used, as it certainly helps to contract the uterus, and in addition give a hot intra-uterine douche of a 2 per cent solution of acetic acid or vinegar. It is a fine thing to do. It has never failed me. This method of procedure has been followed in 5,000 cases at the Sloan Maternity Hospital in New York City, and they have never had a case of post-partum hemorrhage, let alone a death. It is a routine practice with many practitioners to use the Crede method of expulsion of the placenta within from fifteen to thirty minutes after the completion of the third stage of labor, unless the hemorrhage seems to be rather considerable, when it should be done immediately, while the patient is still under the chloroform.

The reason so many have post-partum hemorrhage occurring after this procedure is that they have done it improperly. The placenta should be expelled with one hand making firm pressure on the outside, and then hold the uterus in that position so as not to allow it to relax. If it softens, give a hot vaginal douche, and follow it up by a hot (116° F.) intra-uterine douche. If that does not do the work, give a hot 2 per cent acetic acid douche, keeping your hand on the fundus all the time, and it will control the hemorrhage in every case. The only time that it will not be effectual is when you have not the nerve or intelligence to keep your hand on that fundus. Gentlemen, I feel that I am perfectly correct in saying that those who have not tried this method have no right to an opinion on this subject, and until you have tried it you have no right to express an opinion before such an intelligent body as this.

How to get the patient to send for you before the labor begins is an important question, and one that must receive our most careful attention. As Dr. Lewis has said, no greater honor can be conferred on us than for a woman to send for us to attend her during her labor. If the doctors who

are now paying so much attention to the consideration of stocks and law, talking about them on the street at all times, will talk to their patients, and especially the old women, about medical subjects; if the doctors will take on the function of features, and if you will impress upon them the fact that every pregnant woman should be under the control of a doctor, that she should from time to time see a doctor, we can easily bring about the desired condition. If the woman is a multipara she ought to see the doctor from time to time, but if she is a primipara she should be absolutely under the control of the doctor. If every doctor in Kentucky will begin to change these things, get the old women to help you, and the young unmarried women who are interested in this subject talk about things that will do them some good, you will find that in the course of a few generations the women of Kentucky will be sending for doctors as soon after they become pregnant as it is possible for them to do. This thing can not be done all at once, but it will certainly never be done if we do not make a beginning some time. This is an important subject, and I hope that every one of you will take the matter in hand and begin the good work now. If we do this, I am sure that the indications for operative interference in the practice of obstetrics will gradually disappear until they finally become a thing of the past.

TYPHOID FEVER IN INFANCY.

J. B. KINNAIRD, M. D.

LANCASTER.

Typhoid fever will never cease to be an interesting subject for discussion. It occurs in every clime, and has no respect for persons or places; the rich and the poor, the high and the low, are always liable to its ravages. It has no respect for the palace, and condescends to visit the lowest tenement-house. Under modern treatment it is not so destructive as formerly, still it destroys its thousands every year.

In a recent discussion of the etiology and pathology of typhoid fever in infancy at the New York Academy of Medicine there was a diversity of opinion as to the rarity of its occurrence in infancy and childhood. Dr. Northrup stated that he had not seen, with one exception, a sure case in an infant in twenty-five years, but that it did occur in New York more frequently, according to reports, than in some other cities. Dr. Holt, in the last edition of his work on "Diseases of Infancy and Childhood," says that he has never seen a case of typhoid fever in a child under two years old, and believes it to be rare, though undoubted

cases do occur. During his eight years' service at the New York Foundling Asylum not a single case came under his observation.

Exceptional cases are observed in general epidemics. In an epidemic at Stamford, Conn., in 1895, four cases were seen out of four hundred and six persons attacked. In 1894, during an epidemic at Montclair, N. J., three cases occurred out of one hundred and fifteen persons attacked. All of these cases were traced to infected milk. Holt says: "After the second year typhoid fever is by no means rare, but it is not until after the fifth year that it can be said to occur frequently. The following figures, embracing groups of cases reported by eight writers, represents, perhaps, as well as statistics can, the relative frequency with which the disease is seen at the different ages: Of 970 cases, 8 per cent occurred under five years, 42 per cent between five and ten years, and 50 per cent between ten and fifteen years."

The infant is usually immune, but when an epidemic occurs the infectious material acquires sufficient strength to affect it. The opportunities for the typhoid bacilli gaining an entrance into the system are greater during an epidemic. Typhoid fever, occurring so rarely in infancy, and the mortality being considered so low, has been unrecognized in many cases. Many unsuspected sporadic cases occurring during the summer and early fall are treated for gastro-intestinal disturbances; during epidemics, the attending physician, being on the alert, is more likely to make a correct diagnosis.

Insidious and slow in its attack upon the adult, we have ample opportunity of watching its development and of forming a reasonably correct diagnosis; abrupt in its onset in infancy, we are more likely to err. A great many cases are ushered in by vomiting, followed by extreme prostration and coma. As vomiting is also the initial symptom of scarlatina and other febrile disturbances, we are liable to be misled. When vomiting occurs late in the disease you may suspect peritonitis or perforation, or both. Sometimes the initial symptom is a convulsion. This is also true of many other diseases in infancy. After the convulsion the case runs its usual course. Diarrhea is often present, but is not the rule, for we have more frequently persistent constipation; the stools are not uniformly of the characteristic pea-soup color. The stools are usually green or very dark-green; the eruption is less constant and less abundant. Epistaxis occurs in a limited number of cases. The pulse is usually good but irregular; the classic dicrotic pulse is rare. Functional heart-murmurs are quite frequent;

the nervous symptoms are more marked than in the adult, and instead of active delirium we find dullness and listlessness.

In the small number of cases in infancy and early childhood I have usually found much stupor, headache, moderately high temperature, subsultus tendinum, and rarely carphilogia. Delirium is sometimes active. There is often contraction of the pupils and opisthotonos simulating cerebro-spinal meningitis. In one of the two cases under two years of age treated by me there were many symptoms simulating tubercular meningitis. The infant was sixteen months old, with tubercular family history. Not until other cases developed in the family did I make a correct diagnosis. Eight other cases among brothers and sisters followed in rapid succession, until all were confined at the same time. All recovered. In this infant there was marked tympanites, some opisthotonos, pupils contracted, pulse irregular and rapid. Sometimes it would be in a semi-comatose condition, at others there would be active delirium; its tongue was coated and dry, with slight diarrhea. Carphilogia was marked.

These cases originated in a wealthy family in a country residence in excellent sanitary condition, where there had never been a case of typhoid fever as far as we could learn. All water used by them came from a good cistern. The mother had been occasionally nursing a tenant's infant one year old that had what was supposed to be diarrhea, but must have been typhoid fever, for the child became emaciated, had a high temperature, and recovered in about three weeks. This infant was not treated by a physician. The infection must have been transmitted from the mother to the infant, probably carrying the bacilli in her clothes or upon her hands. The tenant's house was located several hundred yards below the main residence, on a hillside sloping from the residence. It would have been impossible for the bacilli to have been drained into the cistern from that source. All who assisted in nursing these cases, with the exception of those who did not drink the cistern water, contracted typhoid fever, hence it is reasonably sure that these cases originated from the use of the cistern water. Seventeen cases originated from this source, six of which were in young children. As the Eberth bacilli are most frequently found in water, and as infants drink comparatively little water, this may account for its rarity in infancy.

Where infants are bottle-fed, it is the custom in the country for the mother not only to boil the nursing-bottle, but also the milk used, thus

killing the bacilli if any are present. Milk conveys the disease in a large number of cases, it being a most excellent culture medium. The city of Louisville has had a notable example of milk infection by careless dairymen. The bacilli may be conveyed by the air, by clothing, or by the hands; they can be carried by the sick mother through her milk to the infant, or through the placenta to the child in utero. The means of infection are so numerous it is often difficult, and many times impossible, to discover the mode or source of infection.

The mortality is so low we have few opportunities of making autopsies, but the lesions are known to be usually in the gastro-intestinal tract. Frequently no such involvement occurs. It has been known to develop in the lungs; there is hyperplasia of Peyer's patches and the solitary follicles of the small intestines. Ordinarily the smaller the child the fewer the number. In the adult, necrosis of Peyer's patches is frequent; in the infant rare. The spleen is enlarged at the end of the first week; there are the usual parenchymatous changes in the liver, spleen, heart, etc., but to less extent.

The specific bacilli are found in the urine of typhoid patients in a large number of cases. This was demonstrated first by Heuppe, in 1886, and since confirmed by many observers. The urine can, therefore, be a prolific source of infection. Intestinal hemorrhage is rare; I have never seen a case of intestinal hemorrhage in a child. As in the adult, we frequently have bronchitis as a complication. Pneumonia as a complication occurs in 10 per cent of cases reported by authors; nephritis, pericarditis, abscesses, carbuncles, tuberculosis, and inflammation of the joints occasionally occur; otitis and parotitis are common.

Differential Diagnosis. Typhoid fever simulating so many diseases of infancy, and the inability of securing a subjective history, for obvious reasons render a differential diagnosis exceedingly difficult. We must distinguish it from malarial fever, tuberculosis, meningitis, ileo-colitis, and continued fevers. In malarial or any irregular or intermittent fever the administration of full doses of quinine will affect the temperature-curve; not so in typhoid fever. In malarial fever the plasmodium is found in the blood; never in typhoid. In typhoid fever the temperature-curve never touches the normal at any time during the twenty-four hours; in malarial fever it does.

In ileo-colitis the intestinal symptoms are usually severe; there is no enlargement of the spleen, and there is absence of the temperature-curves. The cerebral symptoms of typhoid are hard to distinguish

from meningitis. In meningitis the respiration and pulse are slow and irregular; there is usually local paralysis in meningitis, which is seldom seen in typhoid.

Tuberculosis resembles typhoid so closely that a differential diagnosis can not be made positively until lung symptoms appear. In an editorial in the Journal of the American Medical Association, May 11, 1901, it is said: "The clinical differentiation of typhoid fever is difficult. It took a long time before it was separated from other fevers. Miliary tuberculosis and meningitis are even now distinguished from typhoid with great difficulty, the definite diagnosis at times being made only after careful bacteriologic examination. Recently it has been indicated that other bacteria than the typhoid bacilli, namely, the so-called para-typhoid, may produce the clinical symptoms and signs of typhoid fever. Strictly speaking, the clinical picture of an infectious disease is not always sufficient for its diagnosis; the clinical picture owes its existence to the infecting agent."

Widal's test is undoubtedly of great value for verifying the diagnosis of typhoid fever after the first week, but is not infallible. The agglutination of the typhoid bacilli does not always take place, and has been found in other conditions. The bacilli have been found in rose-colored spots, in bone marrow, and in osteomyelitis.

Treatment. Very little medication is required. The patient must be kept in bed and attended by a sensible if not a trained nurse. The mother is not always a competent nurse, and should be relieved of the details of nursing; she should have regular rest and the most nutritious diet. The sick chamber should be a large, well ventilated, sunny room, away from the noises incident to domestic life. The diet should be exclusively liquid. Milk is the only food required, and all substitutes are a snare and a delusion; it is the only reliable food. If the patient will not nurse, administer peptonized milk. The internal administration of water is both antipyretic and diuretic. Cold and warm water baths are to be used. Children are so frightened by tub baths that I make it a rule to advise sponging with warm water and alcohol. Water should be used "internally, externally, and eternally." When the temperature is above 103° I have the patient sponged every hour. or half hour, until the temperature is down to 99°. Three times a day the nurse is required to give an inunction of olive oil. This reduces the temperature, equalizes the circulation, and furnishes nourishment. If parents insist on giving medicines, I generally prescribe dilute hydro-

chloric acid in as much water as the infant will take. The antiseptic treatment can be followed, but not according to the Woodbridge plan. If there is much diarrhea I give euthymol or listerine, according to the age of the patient, either alone or combined with sub-carbonate of bismuth; when the heart grows weak and the temperature is subsiding I administer strychnine. A combination of strychnia with elixir digestiva (which contains pancreatin, pepsin, and trypsin) makes a nice and convenient preparation. Give no antipyretics unless you fail to reduce the temperature by baths; use the coal-tar derivatives cautiously. Dr. Delafield claims that there is not the amount of danger in these preparations as is generally supposed. For headaches I would prefer some of the bromides. Turpentine stupes can be used for the tympanites present; sometimes it may be necessary to pass a small rectal tube for this purpose. Persistent constipation should be relieved by warm salt water enemata, or by glycerine suppositories. Stimulants are rarely required. Good common sense on the part of the physician and strict obedience on the part of the nurse and attendants are prerequisites for success in the treatment of typhoid fever, either in the adult or infant.

THE IMPORTANCE OF MILK MODIFICATION FOR INFANT FEEDING.

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Pediatrics, perhaps more than any other specialty, has been noted for its many advances in the past few years. Of these the subject of infant feeding has been the most closely studied and has shown the most satisfactory development. The artificial feeding of infants has always been one of the moot questions in the practice of medicine, and the satisfactory development in this line has been due to its close study in the past few years at the hands of many observers.

Empirically, if for no other reason, we know that nature's food is the ideal; nothing will take the place of breast milk. The mere fact that the market it glutted with "substitutes for mothers' milk" and various artificial foods is *prima facie* evidence that no one is suitable for every case. Like the treatment of hyperemesis gravidarum, the multitude of

remedies evidences the fact that no one is a cure. A difficult case of marasmus or malnutrition is never seen but gives the history of having gone through the list of artificial foods. The importance of the subject, then, can not be gainsaid, and without further apology for my theme I would ask your attention to the elaboration of the following thoughts:

First: There is no perfect substitute for healthy mothers' milk in the feeding of infants.

Second: The best substitute for mother's milk is the milk of a healthy wet nurse.

Third: Cow's milk comes next upon the list. It is cheap, always obtainable fresh, and is so capable of modification that it approaches breast milk in its composition.

Fourth: Success in feeding with cow's milk exclusively is dependent entirely upon a clear understanding of its modification by the percentage method. Accuracy in this is of more importance than the compounding of prescriptions.

Fifth: Raw milk is superior to milk submitted to high temperatures for the purpose of rendering it sterile, hence the first requisite for milk feeding is that every precaution be taken in its production and handling, not only at the dairy, but in the home, so as to insure its freedom from contamination.

Sixth: Modification may be accomplished scientifically and accurately, as by the milk laboratories, or at home by the various methods suggested by workers in this subject.

Seventh: Vague and indefinite directions as to the preparation of food will not produce results; as much care, and more, as is given to the administration of medicine must be given in the directions for preparation and administration of milk mixtures.

Eighth: While the weight of the infant is an absolute essential to the proper understanding of the progress of an infant, other conditions besides the weight must be considered, stools, colic, sleep, etc.

In the majority of mothers the milk which nature provides will agree with her child. It is a fact that a perfectly normal amount may be secreted and an irregular nursing be responsible for either its change in quality, so as to disagree with the child, or an error which is much more common, the child is nursed much too often and a perfectly normal milk made to disagree with a perfectly normal child; hence the first requisite to maternal nursing, as well as artificial feeding, is that the feedings should be prompt and regular. This is a rule which should be rigidly

enforced with all mothers. It is not to be denied that analyses of the milk from the same woman at various times of the day will show decidedly different results as to its composition, likewise the milk from different beasts will show different analyses; yet nature provides that the child may take this and thrive upon it. It is a fact also that emotions, fatigue, and many other physical derangements cause a temporary change in the character and make-up of the milk, but generally without detriment to the child. In some women, despite the most careful treatment, the breasts remain flabby and contain but little milk, and finally are entirely empty.

Should the child show evidences of malnutrition, such as stationary weight, or loss of weight, or other signs of milk disagreement, a thorough analysis of the milk is indicated at once by one of the several methods which are possible by any practitioner. Generally this milk can be changed by simple rules, such as prescribed by Rotch, according to the indications made known by the analysis. These are as follows:

To increase the total quantity, increase the liquids in the mother's diet, especially milk (malt extracts may be helpful), and encourage her to believe that she will be able to nurse her infant.

To decrease the total quantity, decrease the liquids in the mother's diet.

To increase the total solids, shorten the nursing intervals, decrease the exercise, decrease proportion of liquids in the mother's diet, and increase the proportion of solids.

To decrease the total solids, prolong the nursing intervals, increase the exercise, and increase the proportion of liquids in the mother's diet.

To increase the fat, increase the proportion of meat in the diet.

To decrease the fat, decrease the proportion of meat in the diet.

To increase the proteids, decrease the exercise.

To decrease the proteids, increase the exercise up to the limit of fatigue for the individual.

Where the mother of an infant is prevented from nursing her child, it is an established fact that a reliable wet nurse gives the very best results. In most localities wet nurses are difficult to obtain, but should one be indicated and obtained, an analysis of her milk should be made prior to putting the infant upon it, and if of an average quality the child can be nursed and its weight and digestion carefully watched.

A wet nurse unobtainable, the next step is the choice of an artificial food. As already stated, cow's milk, in the opinion of all known author-

ities on infant feeding, is decidedly to be preferred. It contains the same essentials as breast milk, but in varying and different proportions—four per cent of fat, four per cent of proteids, four per cent of sugar. Breast milk four per cent of fat, one and a half to two per cent of proteids, and seven per cent of sugar.

Cow's milk, as a rule, is cheap, but the cheaper the milk the less desirable it is, for to obtain a good product the expense at the dairy in its production is necessarily great. The milk should be fresh and modified so that it approaches in its percentages that of breast milk.

This brings us to the consideration of what is meant by the percentage method of modifying milk. Griffiths says that "we now express the analyses of milk in percentages of fat, proteids, solids, water, and sugar, and not in quantities of milk and cream. We think in decimal proportions instead of teaspoonfuls or ounces." (Pennsylvania Medical Journal, March 16th.)

Formerly we gave infants a certain number of ounces of milk, cream, and water, prescribed for certain age, and if this mixture disagreed we had no conception of which element of the milk was causing the disagreement. Now clinical evidence of disagreement is met by a change in the formula of one or more of the percentages, and the result is generally prompt and satisfactory. We no longer feed empirically, but scientifically.

The first essential requirement for milk modification is that we have a milk of definite percentage and guaranteed strength. The proteid, as a rule, is a stationary ingredient, the fat varying considerably according to the breed of cow, food, exercise, etc. In this day of the well-equipped chemical laboratory there is no excuse for not being able to ascertain the amount of fat contained in a given sample of milk. There are few dairies but what are equipped with the Babcock milk-tester, and analyses can be easily and promptly made. For the modification of milk we must have a cream of definite percentage, milk of known strength—milk, sugar, and water. Separator cream may he used, which can be obtained of any strength, containing twelve, twenty, thirty, or more percentage of butter fat.

Objections have been made that cream once separated by the centrifugal process and used in milk mixtures would not give results, it being claimed that it is impossible for milk and cream thus separated to be recombined in the natural homogeneous emulsion. Experience does not bear out this contention in the hands of many observers.

If unable to obtain a separator cream, the work of investigators in this

line has made it possible for us to use gravity cream, or that which rises to the surface of bottled milk after standing for four hours at a temperature not over sixty-five degrees. Reference will be made to this later.

When we refer to the percentages of a milk mixture we mean that if the mixture is chemically analyzed it will show a definite percentage of each of the essential ingredients, fat, sugar, proteids; and the percentage method of feeding makes it possible for us to vary these individual ingredients as the indications arise, either separately or as a whole. We can not emphasize this point too strongly, that the first essential to a proper understanding of milk modification is the possibilities of the percentage method.

There is no doubt in the world that raw milk is superior for the purpose of artificial feeding to milk submitted to high temperature in order to make it sterile, either by sterilizing or Pasteurizing. Submitting milk to high temperatures sufficient to antagonize pathogenic bacteria makes a decided change in its composition. This change is a coagulation of the globulin or proteid molecule, which splits away from the inorganic molecule, rendering it unabsorbable and unassimilable. (Fischer.)

Investigation of scurvy demonstrates the fact that cooked milk is frequently the cause of this disease, hence one of the prerequisites in infant feeding is that pure milk be obtainable. It is most unfortunate that the appropriation available in most municipalities is wholly inadequate to meet the requirements of obtaining a pure milk-supply. It is not only essential that the analyses of milk as ordinarily sold be thoroughly up to the standard, but that the inspection be carried to the dairy. It is here that the contamination takes place, making sterilization or Pasteurization essential before the milk is fit to be used. It is possible to obtain a pure milk-supply for those in need of it, as shown by the remarkable work done first under the direction of Coit, in Newark, N. J., under the plan which he calls "certified milk." This has been recently inaugurated in Philadelphia under the auspices of the Philadelphia Pediatric Society. It simply consists of the endorsement by a number of physicians, preferably a society, of milk dealers whose milk not only comes up to their requirements as to chemical and bacteriological analyses, but whose care of the dairy and the production of the milk and its subsequent handling, as well as veterinary inspection of the cows, comes up to the standard prescribed by the commission. The dairyman pays for the veterinary inspection and for the chemical and bacteriological tests; as compensation for this outlay his milk is sold under the seal or recommendation of

the commission, its standard of chemical composition and purity, as well as the health of the herd, and its scientific production being vouched for by the commission.

This is given in detail because of the importance of the subject and the possibility of each city of any size obtaining without much difficulty such a milk-supply, and forcing other dealers, both large and small, into a compliance with the standard made and maintained by the commission.

Any one cow's milk should not be used in infant feeding, for the milk of a herd does not vary as much in its analysis as milk from one cow, nor is it so likely to be changed by the physical condition of the cow.

A pure milk obtainable, definite, careful, and minute directions must be given the mother of the artificially-fed infant as to the precautions necessary in the preparation of its food. Vague and indefinite directions will not produce results; they must be written carefully and explicitly; the number of bottles and nipples, how they are to be washed and cared for, the temperature at which the milk is to be fed and kept between feedings. It would be well in starting an infant upon a modified milk to first prepare a day's supply in person, that no mistakes can be made.

The weight of the child is most important; a healthy, normal infant should gain from four to six ounces a week. It should sleep twenty hours out of the twenty-four; should not have colic, should not vomit, and should have stools of normal odor, color, and consistency. Any deviation from this normal can be met generally without difficulty by slight modification of the prescribed formula.

Regular semi-weekly weighings, when the child is first put upon modified milk, and later, weekly weighings until the child is at least six months old, and weighings every two weeks until a year old, should be the rule with every baby.

A child who is digesting well, yet seems unsatisfied and restless, should have an increase in the quantity of each feeding before a change is made in the percentages. Habitual vomiting is generally due to an excessive amount of fat; colic is usually caused by an excess in the proteids. Given a normal baby who is not gaining, with normal digestion without vomiting or colic, it is either not getting enough in quantity in the twenty-four hours or is getting a milk too weak in all of its ingredients. The mistake generally made with beginners in milk modification is that a child is put first upon a mixture containing too high percentages, or the reverse may be seen; a child who has not been doing well upon high percentages is placed upon a mixture of low percentages, with a

correction of the error in digestion. The child is apparently normal, but not gaining. If kept upon this low formula too long scurvy or other disease of malnutrition will most likely develop. This is another instance of the importance of regular weighing.

Milk may be modified either accurately and scientifically by the milk laboratory, the Walker-Gordon laboratory, or at home according to the various formulæ devised by workers in this field, notably Baner, Wescott, Holt, Rotch. In my hands the formula of Baner has given the best results, but it is necessary with this, as with other formulæ, to have a milk and cream of definite strength. Milk modification, according to these methods, is simply a question of mathematics. Personally, I have no taste or talent for mathematical problems, but without difficulty have used the various formulæ and have obtained good results. Should the practitioner be disinclined to work out the various formulæ, a reference to the text-books of Rotch and Holt will show many formulæ worked out and the results given for easy reference. The milk laboratory, where available, simply makes it possible for the practitioner to obtain any food for an artificially-fed infant of any prescribed formula. One may obtain gravity or centrifugal cream, any diluent, or, if wanted, any of the patent foods; the prescription is written, giving the formula, the total quantity and the number of feedings for the twenty-four hours, whether raw, Pasteurized, or sterilized, and the milk is delivered each morning in the prescribed number of bottles for the twenty-four hours' feeding, and the bottles for the previous day obtained at the time of delivery.

As regards diluents, much has been written pro and con upon this important subject. It is a fact that the casein of the cow's milk is much more difficult of digestion than that of mother's milk, hence the importance of beginning with low proteid percentage and its very gradual increase. Cow's milk curdles in large masses, mother's milk in much smaller curds. A diluent composed of some of the diastatic preparations allows the milk to form curds much more like those of mother's milk. For this purpose may be used any of the starchy preparations, preferably having been previously converted by the addition of some digestant. Among the diluents may be mentioned barley water, rice water, flour ball water, previously dextrinized. By adding a tablespoonful of wheat, barley, rice, or oatmeal flour to a pint of water and boiling for an hour it will produce a jelly; if there is added to this jelly a teaspoonful of diastase it will become much thinner, so as to be capable of being poured through fine cheese-cloth. When used as a diluent this assists materially, as instanced

above, in the separation of the curds. Chapin recommends the use of cereo as the dextrinizing agent, claiming that the cellulose, or skeleton of the cell, acts as the most effective attenuant of the curd. Others prefer the use of diastase itself, such as is prepared by Park, Davis & Co., Horlick, and others. Lime-water should in most instances be used, because of the likelihood of cow's milk being slightly acid in reaction.

No attempt will be made in this paper to suggest formulæ for difficult cases of malnutrition or gastro-intestinal disturbances; these must be studied individually and carefully, there being no set rules which can be followed.

In a general way it may be said that a newborn child should first be given a mixture of low proteid percentages, with proportionately low fat percentage. Remembering that the proteid is one of the chief essentials to tissue growth, this ingredient is increased more rapidly than the fat after the sixth week, but it must be borne prominently in mind that we can not begin with a high percentage of proteids in a very young infant; can not increase the proteids too rapidly, nor keep it too long on a low percentage. Eternal vigilance is the price of success.

At birth a child should not be given more than a half of one per cent of proteids; at three months it should take care of 1 to 1.5 per cent, and at six months 2 per cent. All recent text-books contain formulæ for the average child at given ages, which serve well as guides. It is well, however, when placing a child on a modified milk, especially when it has been fed previously on some predigested food, to begin with a formula much weaker than advised for the child of its age and weight. It is much easier to increase the formula gradually to meet the indications than it is to correct a disturbance of stomach and bowels from the administration of a milk of too high percentages.

An increase in the total quantity of milk, a gradual increase in all of the ingredients, a more rapid increase in fat than the proteids, or an increase in the carbohydrates, may be tried singly or together for constipation, which is so frequently present in artificially-fed infants. Too much fat causes vomiting, and there are often present in the evacuations many small particles which, at a casual glance, resemble particles of undigested casein or curds, but they are soft and smooth when mashed on the napkin.

Too little importance is attached to the stools as a clinical factor by the average practitioner. Personal observation of the stools must be made by the physician; the average mother can not give a description

of them which will be of any practical value in estimating their clinical significance.

Three per cent of fat during the first few months generally suffices to cause satisfactory gain, and this percentage should not be increased beyond four per cent during the first twelve or fourteen months. Holt suggests that where habitual vomiting occurs the fat in the first formula should not be more than twice the proteids; and if habitual colic is present, one third as much proteid as fat.

A few words in regard to the detail of milk modification and I have finished: The milk sugar is dissolved in the water previously boiled, then strained through cotton to remove the impurities so frequently present. To this is added in a pitcher the definite percentage cream and the required amount of milk, all stirred thoroughly. Enough sterile bottles are provided for the total number of feedings in the twenty-four hours, and the required amount for each feeding poured in each bottle. These are then stoppered with absorbent cotton and stood in a cool place until ready for feeding, the temperature not being allowed to rise above sixty-five degrees. No milk left from one feeding should be administered later, but poured out, and the bottle sterilized for use the next day.

Success in feeding by modified milk in the first place can only be had by the practitioner schooling himself to think in percentages. When a 3 : 6 : 1 formula is spoken of it must be recognized at once that 3 per cent of fat, 6 per cent of sugar, and one per cent of proteid is meant. Secondly, no special formula can be followed closely; the milk must be adapted to the special needs of the infant existing at that time, the various formulæ which have been advised by different authorities being used as guides only.

In conclusion, the writer wishes to commend this method of feeding as yielding better results than can be obtained from any other scheme, or any artificial food or so-called "substitute for mothers' milk."

THE CURE OF ENURESIS.

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Wetting the bed is one of the lesser ailments of children that produces more discomfort than many more serious diseases. Enuresis is normal in the infant, and it is only as the child grows older and more intelligent that the discharge of urine ceases to be involuntary and comes under the control of the inhibitory centers in the brain. The time at which the psychic centers become developed sufficiently to control the activity of the sphincters and inhibit the action of the detrusors varies with the inherited mental and physical qualities of the child, and also to some extent with the general intelligence and fitness of the nurse or mother. If, however, the child has not by the end of the second year learned to control the movements of its bowels and bladder, some local disease may be present, or there is an undevelopable brain from porencephaly, imbecility or allied nerve lesion.

It is not my purpose, however, to devote much attention to obvious causes of bed-wetting; the causes where discoverable should, if possible, be removed. But the number of causes that have been adduced to account for enuresis is equaled only by the number of remedies which have been suggested for its relief.

In the great majority of such cases, however, one is unable to discover any causal factor. The very fact that so many different conditions have been cited as producing enuresis, whereas the same conditions when present in other children do not produce it, should remove them from the group of exciting factors, though they may substantiate their claim to be numbered among the predisposing causes. Any predisposition should, of course, be counteracted, and that phase of our subject will receive brief attention.

Cases of enuresis are those which usually without any assignable reason wet the bed at night. The urine is offensive in odor and frequently alkaline in reaction. It stains the night garments or bedding brown, and rots the bedding very rapidly. It is not clear, but contains floating particles which under the microscope are of an indeterminable nature. The bacteriology has not been worked out, though the offensive

odor to the urine would indicate some abnormal change in it, such as most frequently results from the growth of micro-organisms. As the urine varies from a highly acid to a highly alkaline reaction, it is hardly possible that the same organism is present in all cases. Indeed, it is highly probable that there are a number of bacteria which may produce such changes in the urine as to render it highly irritant to the normal mucous membrane, and which thereby induce a sensitive condition of the bladder, which is suggested as one of the explanations of the phenomena of enuresis.

The great frequency of enuresis and the absence of any determinable cause in most cases has led us to infer that the most frequent cause has not been ascertained, and especially that it is not a neurosis only.

The inefficiency of the usual treatment in ameliorating this common disease has led many to strive in an empiric way to secure some more brilliant and certain results than have obtained under any of the drugs which have been advocated for it. A large outdoor clinic has furnished me with the opportunity of trying all drugs recommended for enuresis on a great number of cases, and the simple treatment which I have learned to rely upon has been gradually evolved and confirmed by most satisfactory results in over one hundred cases in private practice and a large outdoor clinic. My predecessor in the Hospital College of Medicine, the late Dr. John A. Larrabee, was an earnest advocate of belladonna in all cases of enuresis, and I have records of over fifty cases treated by that drug. Belladonna has been highly lauded by all the eminent pediatricians of this country. They find it to be almost universally applicable. Some prefer atropine on account of the definite strength of the alkaloid and the exactness of the dose, and the certainty of its therapeutic action. My experience with it has not been favorable. It has to be used in such large, almost toxic, doses as to border on the danger line. The effects of such large doses are so unpleasant and so alarming often that many have been anxious to secure some drug which was less toxic and more effective.

Holt recommends increasing the dose of atropine, so that a child, aged five, may take one one-hundredth of a grain of atropine at 4, 7, and 10 P. M., and in a footnote gives his experience as follows: "Twelve obstinate cases, in none of which could any local cause be found, were treated by Dr. Kerley, then resident physician in the New York Infant Asylum, in the manner indicated. After five months' treatment seven of the cases were so much improved that incontinence rarely occurred. The

atropine was, however, continued in smaller doses for four months longer, at the end of which time the cases were well. In the remaining five cases but little improvement was seen after five months' treatment, and not until the end of ten months could it be said that much improvement had occurred. In these cases the drug was continued for two months longer and all treatment discontinued, as the cases were cured." Prof. Holt very correctly adds that "in dispensary and private practice the want of early success would have deterred mothers from continuing the medicine."

Strychnine is indicated in those cases in which there is a general relaxed condition of the muscles, and it is of benefit by its systemic action. Ergot is sometimes combined with it when the sphincter of the bladder is too weak, but it will upset the digestion and is of little assistance. To mention the other forms of medication very briefly: Iron in the form of syrup ferri iodidi is of use in the anemic cases, especially as lymphatism is considered an etiological factor, and adenoids are often present. General attention should be given to the diet and to the regulation of the intestinal digestion and peristalsis. Such evident causes as worms, balanitis, phimosis, highly acid or too concentrated urine, vesical calculus, congenitally small bladder should receive their appropriate treatment.

Punishment never accomplishes any good, and though some believe in a form of suggestive therapeutics, it is difficult to understand how a child as sound asleep as these children usually are when they wet the bed can be affected mentally by suggestion or by threats of punishment. Raising the foot of the bed by relieving the pressure upon the trigone of the bladder is sometimes of service. Rhus aromatic, epigeia, cantharides, electricity, etc., have been lauded.

A child presented itself at my clinic in October, 1896, who suffered from enuresis. The examination of the urine showed it to be unusually offensive and alkaline in reaction. Desiring to acidify the urine, and knowing that the usual organic acids would only increase the alkalinity and that the minerals acids were very uncertain in their action upon the urine, I decided to use a saturated solution of boric acid, which has the property of rendering the urine acid. The results in this case were gratifying, and also in the next few cases in which I tried it. For several months then we used belladonna only. During the summer and fall I again used the boric acid, but for the purpose of rendering the urine more antiseptic, salol was added to it. Salol is broken up in the intestines into

salicylic and carbolic acids, and is eliminated through the kidneys in the urine. The results from the combination were most gratifying, and the two have been used now for several years as the routine treatment for enuresis. I do not know any case in which it has failed after thorough trial, and it has been employed not only by myself but by medical friends, who have uniformly reported most favorably upon its use.

Of course it would be useless as well as foolish to claim that enuresis from every cause could be cured by the combination of these simple drugs. It is very easy to see that an abnormally contracted bladder, anemia, malnutrition, etc., would not be cured or benefited by this treatment. I do feel, however, that my experience will warrant the assertion that with the usual attention to any of the evident factors in the case, and in those cases in which no organic lesion can be diagnosed, that this simple treatment will prove satisfactory, and in addition it is practically devoid of danger and easy of administration, and can be continued for considerable lengths of time if it should be found necessary and there is no diseased conditions in the kidney.

I use the word cure in the title of my paper to mean the relief and complete disappearance of the enuresis. I do not claim that there will not be relapses, though I have seen relapses in only three cases, and the relapses came on about one year after the cure was first made. There should be no objection to this claim, for one often says he cures diarrhea, or coryza or bronchitis, not meaning that the patient will never have that trouble again. And so these cases are cured, some permanently; others from cold or exposure may have a recurrence of the attack at later and varying periods. The fact that the child has once suffered from enuresis is a factor in creating a predisposition to that trouble that almost any exciting cause may serve to initiate it again. The three cases which relapsed were easily relieved by instituting the same treatment again.

It may be that I have been unduly optimistic, so it my earnest desire to have this treatment tried by others, so that its delimitations may be established and that a more exact knowledge of its therapy be obtained. If I have seemed to claim too enthusiastically that it is curative, my extenuation is that I have found it so. I desire to have your critical trial of it, so that ultimately good may come to these young children, whose nights are otherwise so uncomfortable.

DISCUSSION ON THE PAPERS OF DRS. KINNAIRD, TULEY, AND BARBOUR.

Dr. THOMAS HUNT STUCKY, Louisville: It is an exceedingly difficult matter to discuss three such excellent papers which are so much at variance as to their character. Taking up the first paper, on typhoid fever in children, the subject of typhoid, as to its etiology and pathology, is too well established to need any further elaboration; therefore we will go at once to the gist of the subject and take up the treatment. We all recognize the excellence of this paper, but I can not say that I agree with Dr. Kinnaird as to the treatment of typhoid fever in children. He unqualifiedly asserts that milk is the best diet in typhoid fever for children as well as for the adult. There is no practitioner here who has not often experienced the fact that after the temperature-curve was apparently running smoothly, there was a subsequent subnormal temperature, and, all at once, from some untoward cause, there was a great exacerbation with chill, and with all the appearances of a reinfection, a re-autointoxication. After the administration of purgatives and laxatives an immense amount of undigested curds was passed from the bowels. I do not believe that milk *per se* is the best line of treatment. I believe that if we follow some of the suggestions recommended by Dr. Tuley as to modifying or peptonizing that milk, or producing a disintegration of the curd, it would be far better. I believe that buttermilk would, in that respect, be preferable to the ordinary sweet milk.

As to temperature, my experience in the reduction of temperature of children by a cold sponge or cold pack has been most unsatisfactory; not that the temperature was not reduced, but that the amount of nervous disturbance seemed to be so great, and the excitement and the fear of the bath were so pronounced that I really believe the reduction of the temperature produced a greater discomfort than the fever, and was equally as dangerous and harmful. With these little ones we can frequently use the hot sponges, the hot pack, wrapping them in a hot bag, especially where there is delirium. This procedure seemingly exercises a most marked influence, bringing about a satisfactory sleep. During the last few years I have had some experience with liquid guaiacol, but I can not feel that it is followed by such pronounced depression as many have said. My observation has been that if carefully used and rubbed into the abdomen, grading the dose by inunction from one drop up, according to the age of the child—a drop for every two years for the first three years—we would be enabled to reduce the temperature from one to three degrees.

I believe, gentlemen, that the great danger in typhoid fever lies in the character of the diet we give rather than in the fever itself. Typhoid fever, in the majority of instances, is a self-limited disease, and I believe that by proper elimination—the opening of the sewerage, so to speak—the preven-

tion of the clogging of the secretions, especially the interference of oxygenation as manifested by stupor, is all that is necessary in its management. It is true that this really means controlment of the temperature and the diarrhea, and I believe the best agent for controlling the diarrhea of typhoid is calomel in full doses, unhesitatingly given. Give it until the marked antiseptic influence is manifested, characterized by a change in the stool, producing a marked flow of bile by irritating the duodenal mucous membrane, but without irritation of the liver.

As to the question of stimulants, I unhesitatingly put strychnine at the head. It is simple and safe. One held to by the late Dr. Hewitt, of this city, was camphor water, which seemingly exercises a sedative influence and is continuous enough in its action to keep up a marked cardiac support. I think the present method of using digitalis or its alkaloids, or strophanthus or scoparrus, is not as valuable as was at one time supposed. When we take into consideration the difference in time of action of these drugs, we must feel that we can not give them with any degree of safety. We are taught by one observer that the active principle of digitalis, digitaline, has an action which is limited to four hours. We are taught that the active principle of strophanthus is more lasting, as much as six hours. Careful observation has forced me to believe that this is entirely dependent upon the patient's idiosyncrasy, and that there is no law and no rule which we can map out for the government of these conditions.

I have nothing to say regarding the second two papers except to speak of their high excellence. There are so many gentlemen here to discuss these papers that time will not permit of my taking them up, as I should like to.

Dr. F. J. YAGER, Campbellsburg: I have had so many cases of typhoid fever since I have been in the practice of medicine that I feel that I should not let this subject pass without saying something as to my experience in the treatment of this condition. Many years ago I had eighty-four cases of typhoid fever during the course of several months, and I found that so little would result from the treatment that I almost felt like deploring the treatment of typhoid fever. I remember that I tried all kinds of remedies, some of which at that time had the reputation of being so-called specifics, but nothing seemed to do my patients any good. I finally began to abandon the treatment of the disease itself, and simply applied all my remedies to the different conditions which arise in the course of a case of typhoid fever. I have tried a great many of the remedies mentioned by Dr. Stucky, but nothing yielded the result which I expected to realize. I would use remedies in one case with great success, and when I used the same treatment in another case it did no good at all.

Now, what did I find to do the most good? Just watch the disease very carefully, and use only such drugs as were indicated by certain emergencies. If I had too much heat I would not use a cold bath, but I would use a warm bath, and I believe I have done more good with warm water than

with any other remedy I could give—warm water externally and internally, by rectum and by mouth, in every way that I could use it. Another thing with which I have done good in addition to warm water has been small doses of calomel, the dose being regulated by the age of the patient and the disease in question. I have used calomel and the nitrate of bismuth, and I believe that I have done more solid good in this way, controlling the gastro-intestinal tract, than any thing I have ever tried.

Dr. R. B. GILBERT, Louisville: I want to commend the very excellent paper on infant feeding. I do not think that this Society has had a more important topic to discuss. Especially is it of importance to the city population, where the children have to be fed on milk that has been brought in from the country, and which has stood for several hours and consequently contains a great deal of germ life. The essayist has formulated a perfect line of feeding for infants, one to which no objection can be raised. No matter whether you use Rotch's or Holt's formula, so long as you carry them out according to instructions and with precision. They will certainly bring marvelous results. In the vast majority of cases, however, this correct detail can not be carried out in the feeding of infants. It is impractical, as we all know. Especially is it impractical in city practice. Therefore, I wish to speak particularly of what I think is the next best method. It has become my duty frequently to prescribe for people who could not accomplish this proper modification of the milk, and I have therefore followed several other plans which served a good purpose and are worthy of mention.

Last summer I was asked to visit an infant asylum located near this city. I was asked to make some suggestions as to the modification of their method of feeding. The good sister in charge told me that out of 100 children housed in that asylum, 90 per cent of those that died, died as the result of improper feeding, which certainly made it desirable to correct their method. I carefully investigated matters, and I am convinced that a large majority of the deaths were due to a faulty feeding. I suggested a Rotch's formula, but it was found to be rather irksome to carry it out in detail for so many infants. My next suggestion was that they use fresh cow's milk, and the plan suggested was to have two or three cows giving good milk driven up into the yard and milked, and the infants to be fed at once while the animal heat was still in the milk. That plan is the ideal plan in the absence of a wet nurse. It is the only successful and practical method of feeding the infant at large, and is one which is practical almost everywhere. The object of this way of feeding is simply to get the milk before it is infected by any micro-organisms. The milk we get here in the city may be infected by standing around the farmyard, at the railroad depot, or at the local milk depot, and no matter how much you may sterilize that milk, you are bound to spoil the nutritive quality of the milk, besides being unable to render it perfectly sterile. Take the milk directly from the cow's udder while it still contains the animal heat and is not yet contaminated by bacteria. Do not

take the first nor the last quantity voided, but the middle quantity of milk. Then be sure to take the specific gravity of it, which should be 1032 if it is of the proper quality. I have practiced this plan for the last few years, and I am sure that I have saved the lives of many infants. They are fed about six times during the course of twenty-four hours; from 10 at night until 6 o'clock in the morning they get no milk whatever; they do not need it and should not have it.

Dr. J. G. CARPENTER, Stanford: In regard to the cure of enuresis, I have often found that in a female child it is caused by an inflammation of the clitoris, or the vagina, or even the endometrium itself. Time and again I have examined the rectum and found a small fissure or hemorrhoids or a proctitis. By locating the cause and treating it you will invariably cure the enuresis. Then, too, it is often due to some disease in the digestive organs.

In male children I carefully examine the prepuce for adhesion, or retained secretion, or preputial calculi. Immediately upon removing the pathological condition the enuresis will subside. I have also found the same condition in the rectum of the male child as in the rectum of the female child. Again, the diathesis has a great deal to do with it. There may be excessive uric acid, and by dieting the patient accordingly and abstaining from drink, especially tea and coffee, and abstaining from eating highly seasoned foods, it is comparatively easy to cure these cases of enuresis. Too frequently we attempt to alleviate enuresis by remedial measures in place of giving the patient a careful examination, thus arriving at the cause of the condition.

Dr. H. W. LEAVELL, Louisville: I wish to supplement what Dr. Tuley said in regard to the regularity in the feeding of infants. We often hear it said that a child should not be roused from its sleep in order to take its food. I think that this is an erroneous idea. The child should be aroused regularly during the day in order to take its food. In regard to the increase in the quantity rather than the modification of the percentage of the fat, proteids, and sugar, I think that when a child is gaining in weight it does not make any particular difference what the percentage of proteids, fats, and sugars really is. If a child nine months of age is constantly gaining in weight on the diet of a child three months of age, that diet should be maintained until the weight of the child begins to diminish. Furthermore, whenever we start to administer an artificial diet to children, we should go back three or four months from the age given in text-books.

I wish to say something in regard to the manner of feeding infants as described by Dr. Gilbert. I believe that it is the consensus of opinion to-day that the one-cow manner of feeding is obsolete. I may be mistaken, but I believe Dr. Gilbert said that one cow should be kept for a child, and that the child should be fed from that cow daily, fed from the udder. I do not believe that it is possible for any infant to thrive on the milk of one cow for any length of time. The reason is certainly clear. A cow, just like a

woman, may become ill and its milk become modified. Furthermore, in certain seasons of the year the milk of a cow is not at all fit for administration. Under these circumstances it is certainly best to get the milk from a herd of cows.

I believe a most excellent drug as an antiseptic for the intestinal tract is calomel. I do not agree with Dr. Stucky as to the dose of calomel which should be used. I think a small dose, frequently repeated, is the best. I give one twentieth to one tenth of a grain, and the results are beautiful. The calomel has not only a laxative effect, but a diuretic effect as well, which is a very important element in eliminating the toxines developed in this disease.

Dr. GILBERT, Louisville: The mother's milk may modify in one night just as the cow's milk does. If the mother indulges in excessive venery, or becomes pregnant, or commits indiscretions in diet, the milk is not wholesome. If the cow's milk becomes modified for any reason, it is a comparatively simple matter to substitute another cow.

Dr. W. W. RICHMOND, Clinton: I want to endorse what Dr. Wilson has said concerning the artificial feeding of infants. I think there are altogether too many preparations of so-called infant foods on the market, none of which has had its nutrient value positively determined, and which, unless prepared with cow's milk, do not meet the demands of nutrition. I think the medical profession has been led to rely too much upon these preparations to the exclusion of cow's milk, which, when properly prepared, is an excellent substitute for the mother's milk.

I do not think that the plan proposed by the gentleman who has just spoken, of procuring milk for the infant from a herd of cows, practicable. It might succeed in the city, where milk can be obtained from a dairy, and even then I would question its reliability. In the country and village, however, it would be utterly impossible, and therefore I suggest the feeding from one cow. The cow should be fresh and in health, and keep so by careful attention. The quality of the cow's milk may be regulated like that of the mother's milk by careful treating.

I have had success in keeping a cow in a grass lot free from noxious weeds and supplied with pure, fresh water, feeding her twice daily and avoiding swill and other fermented food, washing the udder thoroughly each time before milking, and feeding the infant with milk fresh from the cow, and prepared according to the age of the child. In this way the practice of making the daily supply of food every morning is avoided, and I am convinced that it averts much danger which usually follows the feeding of a mixture which has undergone changes which render it unfit for use.

VENTRAL HERNIA: PREVENTION AND CURE.

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One need only scan the current literature to become impressed with the stress laid by the surgeon upon the prevention of post-operative hernia. This is quite evident, as expressed by the varieties of incisions made through the abdominal wall as a means of approach to the organs contained therein, and the fact that these various incisions are modified in direction and exact location and method of making by different authorities. As further proof are the methods of closure, of which there are numerous variations, not only in technique, but in material used in effecting the closure.

It is very evident, then, that hernia does still occur as a result of abdominal operations, or why this diversity of opinion upon what seems at first glance to be the simplest part of an operation? Since the indiscriminate use of the drain, and especially the tube, their frequency has decidedly lessened. Another factor in their prevention has been a more perfect attainment of asepsis, and with the advent of perfect antisepsis and a correct technique in making and closing an incision, it will be a thing of the past. So long, however, as we occasionally meet with septic conditions within the cecum, which we can not by antisepsis render absolutely and positively sweet and sterile, just so long will we occasionally meet with this sequel. Even now, the above conditions being not yet attainable, I believe that with proper methods the occurrence can be very materially lessened. I am not one of those surgeons who has never had or seen a hernia follow one of his operations. I have seen a number after a certain class of cases, and expect to continue to see them, but I do not meet them nearly as often as formerly, and their occurrence is no bar or argument against an operation. I am further sure that they can all be cured, even the congenital or "non-surgical" variety, though from text-book reading one would think this was in the majority of instances impossible, and that a cure after operation was rather a piece of good fortune than good surgery. Why this belief should obtain, or at least be the present text-book teaching, I fail to see, and believe that the chapters on umbilical and ventral hernia have been overlooked in recent

editions, old ideas being still advanced just as is the case with hydrophobia.

Practically all congenital hernias and those occurring in infancy can be cured in the earlier years of life by mechanical appliances in the form of a properly constructed and fitting bandage. In operations for their cure it has been my custom to remove quite a bit of the omentum, and a portion is always found adherent in the sac, for I believe that excessive omental development has something to do with the production and maintenance of this variety of hernia. With this precaution and a proper closure I think there would be no recurrence. Two cases in advanced adults, operated upon more than two years ago, have shown thus far no evidence of a relapse.

L. C. Was first seen in the spring of 1899, for an umbilical hernia, from which she was suffering considerable pain. Pain was almost continuous, and an operation was advised for a cure of the hernia, in which it was thought some omentum was adherent, which gave rise to most of the suffering. This patient had a very fat abdominal wall, but through it the hernial opening could distinctly be made out, the sac seeming to occupy the subcutaneous fatty tissue. The operation was done in June of 1899, an incision being made in the median line down to the sac, which was then partially separated, it being the size of a small orange. The peritoneum was opened and the adhesions to the sac, which consisted entirely of omentum, were separated and the omentum ligated and removed. The peritoneum was closed by continuous suture of catgut. The edges of the sac were then cut away and the fascia split, the posterior layer being brought together by means of a chromicized gut suture. The muscle was united in the same way, and the anterior layer of the fascia by an interrupted suture of chromicized gut. The fat layer was now brought together by three plain catgut sutures, and the skin united by a subcuticular silkworm suture. The skin suture was removed after two weeks, the patient kept in bed for three weeks, and discharged with instructions to wear an abdominal supporter, with which she was provided for six months. Over two years have intervened since operation, and there has been no tendency to a recurrence.

L. S. (col.) Was operated March 28, 1900, for ventral hernia just above the umbilicus. The sac contained some adherent omentum, which was separated and removed with a piece of the greater omentum as large as the hand. Abdominal wall was exceedingly fat, fat layer being at least three inches in thickness. The method of closure was the

same as in the case detailed above. Convalescence was uneventful, and she was discharged at the end of three weeks. The patient was seen a short time ago, and has no evidence of a recurrence.

Another case seen with Dr. Holloway, in which I assisted him in performing the operation, presented a hernia the size of one's head. This was also in a fleshy patient. The tumor was surrounded by an elliptical incision, leaving the skin covering the sac with its fat to be removed with it. The sac was then dissected out completely down to the ring on either side; it was then opened at its base, everted, and the omentum, which was adherent to the sac throughout, was ligated after separating the adhesions, the remaining portion comprising probably a third of the greater omentum. The closure carried out was practically the same as in the other two cases. A year has elapsed now since this operation was done, and I understand from Dr. Holloway that there has been no evidence whatsoever of a recurrence, the abdominal wall being firmly united.

In persons of this age, and especially if fat and obliged to lead a very active life, operation for a cure should be advised. In such patients incarceration or strangulation may occur and give rise to very ugly conditions, resulting often in death. One of the worst surgical emergencies I have ever met with was in a case of this kind.

Mrs. S. Referred April, 1896, by Dr. Herman, then of this city. Patient was fifty-two years of age, and presented an umbilical hernia as large as a water-bucket, the enlargement being more to the right of the median line. This rupture had given her trouble all her life, and had at times become incarcerated, but was always capable of reduction. She had worn an abdominal binder, but this would never retain contents in the cavity. She was a large woman, very fat, and had had five or six children. The hernia became strangulated about three days before I saw her, but Dr. Herman being unable to reduce it after persistent efforts, sent for me. I advised an immediate operation, which was not accepted. At that time her pulse was good, and she had very little elevation of temperature; there was no shock, and the patient was in an excellent condition. Two days later she decided that she would undergo the operation, and telephoned me from the infirmary, where she had gone. When seen before the operation the entire skin covering the tumor was somewhat red and boggy, but at the most prominent part of the tumor it had a slightly greenish color, being, in fact, gangrenous. She was prepared with all haste possible, and an incision was made directly over the most prominent part of the skin, extending well above and below the tumor.

Through this incision the sac was opened, and two greatly distended coils of intestine presented themselves. Considerable foul-smelling, dark red fluid escaped from the sac, which was markedly gangrenous, as were the coils of intestine. The sac was incised above and below to relieve constriction, and it was decided to do a resection, it being recognized that this was the only procedure that could possibly save the woman. Dr. Vance, who was assisting, resected one coil of gut and I the other, there being two coils included in the hernia. Between five and five and a half feet of intestine were removed. A modified Woellfler's method was used. The omentum contained in the sac was also gangrenous, and it was ligated and removed back to healthy tissue. Even after completing the resection we had a great deal of trouble in returning the intestines and omentum to the abdominal cavity, presumably because it had accommodated itself to lesser contents than we endeavored to make it contain. The sac was closed with a great deal of difficulty with a mattrass suture of heavy silk, the remaining tissues being closed by a through-and-through suture, with drainage at the upper angle of the wound. The time of the operation was not more than an hour and a quarter, but the patient was put to bed in very bad condition.

The evening of the day of the operation pulse fell to 90, and the patient felt quite comfortable, though she died at the end of the second day. There was no peritonitis, and death, in my opinion at the time, was caused by septicemia, which existed at the time of the operation from the absorption from the gangrenous bowel and sac.

The coronor, who made the autopsy, informed me that the intestinal sutures had held, and that the bowel was very well united, there being no leakage at the point of suture.

Such cases as these can also be prevented by treatment applied as stated, beginning early in life and persisted in for at least three or four years. The post-operative hernias, however, are in a different class; they can be prevented only by the means indicated, and sometimes not even then if we drain, or cured only by properly executed operation. As an indication of the frequency of this condition as a consequence of abdominal operation in the past, I may mention that from March, 1891, to December, 1895, over two hundred cases were seen at the Hospital for Ruptured and Crippled in New York. This relatively great frequency has been a most potent argument in the hands of our friends, the vaginal sectionists, and was really one reason why the French surgeon, less dextrous than his German or American colleague, conceived and executed this substitute for abdominal section.

As indicated, however, this sequel can, in all but a certain class of cases, be avoided by attention to the incision: (*a*) its direction, (*b*) location, and (*c*) proper closure.

(*a*) In considering the direction of the incision, there should be borne in mind constantly the direction of the muscular fibers, of the fascial and also, not of less importance, the blood and nerve-supply. Muscular fibers should never be cut if it can possibly be avoided, but the muscular bundles may be separated or split in their long axis. This avoids retraction and enlarging of the cicatrix. It prevents tension on approximating sutures, and when the muscle is in action the wound is closed, as it were, by the opposing muscular lips being brought together.

For the same reason the fascia should also be incised in the direction of its fibers. In certain operations we may find it necessary to change the direction of the incision as we pass through the different layers of muscle and fascia, as in the case of operating for appendix diseases. The "gridiron incision" is based upon this principle, and is, therefore, all things else being equal, the best way to approach the appendix.

Furthermore, and for equally as cogent reasons, the direction of the incision should as far as possible conform with the direction of the nerve and blood-supply. Fortunately these, as a general rule, in the abdominal wall, follow the lines and planes of muscle and fascia. In case this does not apply, it is best to look for nerves, especially larger ones, and instead of dividing them, to draw them aside with a retractor. The division of nerves may have a marked influence on the nutrition of a muscle, and may cause loss of normal muscular power and atrophy leading to a true hernia or to a condition equally annoying and less amenable to treatment; that is, a general protrusion or bulging of the entire region supplied by the divided and ununited or impaired nerves, and this without a true hernia through the wall at the point of incision. Such conditions are seen most often, I think, after appendicitis operations.

(*b*) The point of opening the cavity should be made with a view to (1) the ease of subsequent closure of perfect approximation; (2) the ease and thoroughness of operative manipulation; (3) the character and direction of intra-abdominal pressure.

(1) Should the rules as detailed under the previous caption in regard to the incision through muscle and fascia be followed, the wound will be more easily and perfectly closed, and the subsequent union will be more perfect, the cicatrix more narrow, and, therefore, more resistent. So in selecting a point for incision this must not be overlooked.

(2) The ease and thoroughness of manipulation. By attention to this detail we expose the wound surfaces to less trauma, consequently less liability of infection and more perfect and rapid healing without suppuration. For this reason in pelvic work we go through a median incision, even though we may feel assured that the condition to be dealt with is a unilateral one, and we might get closer to the seat of disease by a lateral incision. And for the same reason we approach the gall-bladder or appendix as we do, though the same result might be obtained, as far as the surgical procedure is concerned, by a median incision. As stated, ease of manipulation lessens contusion of tissues; it also shortens the exposure to infectious material, thus reducing to a minimum conditions which retard union *per primam*, and which would conduce to subsequent hernia formation.

(3) Character of intra-abdominal pressure. As illustrative of this detail in opening the cavity, it is only necessary to call your attention to the very infrequent hernia following kidney surgery through the loin as compared with opening the anterior wall. Even with the operation more easily carried out from a manipulative standpoint, it were better to do this class of work from behind, unless, of course, other important considerations outweigh.

In speaking of making the incision, it is well to bear in mind certain points in addition to those mentioned:

1. Have the opening sufficiently large.
2. Do not try to do four-inch work through a two or three-inch incision. By so doing the tissues are torn, contused, and often their vitality completely destroyed.
3. Also make clean-cut incisions.
4. Do not hack or chop or nick through the wall, but cut through by a continuous line of incision, using a sharp knife or sharp scissors, and if a knife, use the belly and not the point.

(*c*) Closure of the wound. This, I take it, is the most important step in the operation, so far as the prevention of hernia is concerned. The incision is not only to be closed, but to be closed in the manner to obtain the best union, to run the least risk of suppuration in the stitches, and to leave the least opening, should drainage be necessary. In my opinion, and in my hands, this is best obtained by the tier suture, uniting each layer separately. Grieg Smith objects to the tier suture on account of the "dead spaces" left between the layers, but this can be easily overcome by including always in the suture of one layer a superficial portion

of the layer beneath, except when suturing the skin, which should be sutured separately.

My plan is to close the peritoneum with plain No. 0 or No. 1 catgut, then to close the deep fascia, especially above the semilunar fold, with chromicized gut in a continuous suture, an interrupted suture of the same material for muscle, and the same for the superficial fascia. If there is much fat, a few sutures of plain gut suffice, and the skin is then closed with a cuticular suture of horsehair or silkworm gut, or silkworm subcuticular suture. In operating for appendicitis or through any region where muscular and fascial layers are more numerous than in the median or semilunar line, each layer is united separately to its fellow on the opposite side of the incision. These sutures remain in the deeper structures from five to six weeks before absorption, at which time union is solid and firm. Another advantage is that in case the skin sutures become infected, the purulent process does not involve deeper structures, but remains superficial to the fascial plane. This is to me quite a consideration in the prevention of hernia, and most of the cases I have seen, and I believe all the cases I have operated, have had numerous openings to one or the other side of the incision, clearly through the stitch opening in the structures, and have always presented a cicatrical skin covering at the seat of the stitch cicatrix or hole in the skin. One case I operated upon had half a dozen or more such small herniæ, and I learned that many of the through-and-through sutures which had been used had suppurated.

Tubular and gauze drains are very potent in hernia causation on account of the large opening left through the wall. This can be much lessened by using the gauze wick as introduced by Morris. This usually leaves only a small opening very much like a buttonhole, and not the round opening punched out, as is seen after the ordinary methods. Again, the rubber tissue does not interfere with granulation, as it does not adhere to them as does gauze, nor make the pressure as does glass, and the edges can be brought together and a quicker union obtained than after the use of glass or gauze.

In operating for the cure of ventral hernia, post-operative, I have used the same method of closure and have gotten uniformly good results, so far as I have been able to follow my patients and learn their condition. I claim no priority for this method of closure, as it is one in common use, but I do wish to state most emphatically that with the tier suture, properly used, and care as to the aseptic condition of the sutures, ventral

herniæ are far less frequent and suppuration much less often seen than with the through-and-through suture. The difficulty in tying a through-and-through suture to obtain just the requisite approximation of each layer is not a fanciful one. Almost invariably the skin or fat is constricted, resulting in death from pressure and infection by the epidermal cocci and pus production along the suture tract to a greater or less depth.

In operating for the cure of hernia I have always found a part of the omentum adherent to the sac, sometimes only a small portion, at others quite a large bit. This is in itself evidence of an infection. It is well to always remove as much of this omentum as possible. Great care should be exercised in going into the sac of these herniæ, as the only coverings are the peritoneum and cicatricial skin tissue, which is much thinned out. I lay much stress on bringing the muscle together, and the fascia should always be split far enough back to secure a good bite on it. The fascia must be well approximated, especially the anterior layer, though in the median line above the semilunar fold the posterior layer is equally as strong, and if the anterior layer can not be well approximated, this layer should receive the treatment given in one of the reported cases.

The details of such an operation and also factors in the production of such hernia can be best given by reciting a few typical cases which were operated upon.

C. McE. Was operated upon in April, 1894, for a post-operative hernia of five years' standing. An operation had been done for a double pyosalpinx, drainage-tube had been used, and convalescence had been completed only after some time. Suppuration had taken place in all the sutures which were used. There were three sacs: one in the median line, and two upon the right side, they being at the seat of two suppurating sutures. The coverings of these sacs were exceedingly thin, consisting only of the skin and peritoneum. An incision was made into the central sac; it was found to contain a portion of the transverse colon, slightly adherent, and a part of the great omentum, also adherent. These adhesions were separated and the sac closed by through-and-through sutures. On account of the time consumed nothing further was done; patient was discharged at the end of three weeks, and returned the latter part of May, feeling much better.

This operation was the first one that I ever did for ventral hernia, post operative. To-day I would have performed the operation in an entirely different manner. As it was, two of these herniæ were left; the

one that we thought to cure returned in a few months, and the patient still has it. I have seen her within the last two years, and the hernial sacs are now as large as the head, and constantly giving trouble.

Mrs. M. Was operated upon ten months ago for an extra-uterine gestation. It was necessary, in order to save the patient's life, to use gauze packing and drainage, so that it was impossible to close the lower angle of the wound. She recovered completely, but with a large hernia at the lower angle, the separation in muscles being between five and six inches, the hernial sac at the ring being at least fourteen or fifteen inches in diameter. This patient was operated on in my clinic in January, 1900. An incision was made directly through the skin into the cavity. The adhesions to the sac being separated, the sac, including the skin covering it, was then cut away. The structures were closed by tier suture, catgut being used for the peritoneum. It was impossible to close the anterior layer of fascia, so we were compelled to satisfy ourselves by closing posterior layer only. The patient, however, made an uneventful and perfect recovery. The cicatrix was at least six inches in length. When last seen, fifteen months after the operation, there was no evidence of a recurrence, notwithstanding the patient has been doing the work of a cook and laundress, and subjected the cicatrix to much strain. We consider the cure a perfect one, and think no relapse will occur.

F. G. Had been operated upon in October of 1898 for fibroid tumor of the uterus. A neoud was used, the patient making a good recovery. When seen there was a hernia as large as an orange at the lower angle of the wound, the protrusion being at the seat of the the uterine stump. There was a slight opening at the lower portion of the hernial sac at its juncture to the abdominal wall, through which she occasionally had a slight discharge of blood, probably menstrual. She was operated upon April 7, 1900.

After separating all adhesions, the stump of the uterus was freshened and whipped over with catgut, and dropped back into the abdominal cavity away from the wall. The structures were then closed without any difficulty by a tier suture. She was kept in bed for three weeks and discharged at the end of a month. She was seen in eight months after the operation, up to which time she had had no trouble at all; the union was firm, and there was no evidence of a recurrence.

The next case is that of M. F., the patient having been operated upon only a few months ago. This case is reported as showing the occurrence of hernia through suppurating stitch-holes. Her convales-

cence from her previous operation, as I find it shown on the hospital records where she was operated upon, was quite a stormy one, she being confined to bed on account of stitch abscesses for nine weeks, and not being able to leave the institution for three months. Even then there was a superficial sinus in the line of the abdominal incision.

She presented several small sacs on each side of the cicatrix, and one at the lower angle of the old wound. These were encircled by an oval-shaped incision which was extended above and below the median sac. This was opened, and after separation of the omentum in the main sac, and in those which were at the seat of the stitch-holes, the omentum was ligated and cut away. The smaller rings were closed from within, the skin covering having not been incised. The technique employed was to close first the external fascia, then the muscle, then the deep fascia with chromicized gut, and then to close the peritoneum with plain cat-gut. The main incision in the median line was brought together by usual tier suture. Six silkworm gut sutures an inch apart were placed through all the structures down to the peritoneum to relieve the tension. She was discharged in six weeks with a perfect cicatrix and without any evidence of a recurrence. She has been seen within the last three weeks, and it is believed a good result will be obtained.

THE OPHTHALMOSCOPIC DIAGNOSIS OF BRIGHT'S DISEASE.

DUDLEY S. REYNOLDS, A. M., M. D.

LOUISVILLE.

The first attempt to connect renal and ocular diseases may fairly be attributed to Wells, who, in 1812, pointed out the co-existence of amblyopia in dropsies of puerperal women, and in cases of scarlatina.

In 1836, Dr. Bright, of Guy's Hospital, published an account of thirty-seven cases of albuminuria with uremic manifestations, in four of which there was loss of sight. Other observations of this nature were published from time to time.

In 1850, Turck, of Vienna, published an account of the histologic changes in the retina, which he observed in persons who had died of renal disease.

In 1859, Prof. Liebreich announced in the Archiv. f. Ophth., vol. 5, page 266, certain ophthalmoscopic appearances, "so exclusively peculiar that we are thereby enabled to diagnose with certainty the renal disease." Continuing, he says: "The white opaque zone which surrounds this portion of the fundus is produced by the sclerosis of the nerve fibers and fatty degeneration of the cellular tissue. The latter occurs isolated in the very small round spots which are on the edge of the white figure, and which assume a star-like arrangement at the macula lutea, looking as if sprinkled on the fundus." Writing at a later period, 1870, in the Atlas, he says: "The condition is due to the development of the granular cells at the extremities of the radiating fibers; the granular cells being recognized as white points.

"The hemorrhagic extravasations so frequently observed all lie in the internal layer of the retina. Fig. 2, plate 9, in the Atlas, represents the disease in the more advanced stage. The cloudiness and whitish opacities have here for most part disappeared, so that the persistent alterations in the macula lutea are still better seen than in the former case. The veins, which in figure 1 are considerably overfilled, are here not thicker than normal, though in some places they are more tortuous. Although still thin, the arteries are better filled than in the earlier stage, where they are almost entirely empty. The white streaks which accompany them in some places are formed of their thickened external coat."

The fact that he believed the conditions described absolutely pathognomonic, led the entire profession to accept this view.

Lawford, in Norris and Oliver's System, says: "Uremic blindness may occur in any of the various forms of renal disease in which there is sufficient interference with excretion by the kidneys to load the blood with those poisonous materials which produce the uremic condition. Amaurosis is more common in acute varieties, those caused by scarlet fever, smallpox, and some other eruptive fevers, pregnancy, and exposure to cold."

Dr. Marcus Gunn described a variety of conditions in which arterial degeneration occurs, and demonstrated in a very satisfactory manner the appearance of the retinal vessels in the subjects of widespread arterial sclerosis, common in albuminuric retinitis and acute granular nephritis.

Lawford says, in a footnote: "It is perhaps not superfluous to remark that retinal changes of whatever kind are not in themselves conclusive evidence of the existence of Bright's disease."

Statistics of different writers vary from 9 to 30 per cent as to the relative frequency with which retinal changes are observed in Bright's disease. In a small proportion of cases where treatment has relieved the renal condition the retinal disease has likewise cleared away, and nearly normal appearances and conditions are established. If degeneration of the nerve fibers or of the coats of the arteries were present, it is clear recovery could not take place; that fat cells or granules might appear in such aggregation as to produce masses of white radiary striations around the macala, so characteristic of retinitis albuminurica, is no longer to be doubted.

The hemorrhagic effusions into the inner layer of the retina, along the course of the arteries, could hardly be due to fatty degeneration of the vessels. It may possibly follow that the fatty deposit in the outer layers, on account of the increasing pressure upon the retinal capillaries, and the movement of pulsation of the arteries, would allow effusion of blood into the contiguous spaces beside the larger vascular trunks. This may explain why the arteries are reduced in size and become tortuous as the disease advances. The fact that the retinal affection never occurs until the renal disease is well advanced, and that failing vision is the first symptom that leads the patient to seek relief, accounts for the frequency with which the ophthalmic surgeon is first to discover those pathologic changes indicative of renal disease. This hypothesis would seem strengthened by the further fact that very few persons with retinitis albuminurica live beyond twelve months from the beginning of the retinal affection.

Detachments of the retina, so often cited as a complication in those cases of fatty deposit around the macula in Bright's disease, are generally first seen as an edematous condition. The retina, being creased by the irregular folding of the redundant infiltrated retinal tissue, presents a convoluted appearance common in detachment. I have seen this condition fade rapidly away under the effects of pilocarpin, in a man with hypertrophy of the heart. In this case, fatty deposits around the macula, disseminate hemorrhagic effusions, edema of the retina and disc, with nearly total loss of sight, melted away under this treatment. There was at no time, while under my observation, any albumen in the urine. He had, however, polyuria with specific gravity 1004, and a few hyaline tube casts.

It may be fairly stated that fatty deposit in the retina, presenting a series of radiary striations around the macula, with more or less accompanying deposit of a similar nature in other parts of the retina, and

sometimes with disseminate hemorrhagic effusions, with reduced and tortuous retinal arteries, are never observed without co-existing renal disease. It is clearly true, however, that these conditions do not appear until the renal disease is well advanced. Unfortunately structural changes in the kidney may exist in the gravest form without creating such symptoms as to lead the subject to seek medical advice. Fatty deposit in the retina not assuming the form of radiary striations, which give to the macula a stellate appearance, are common in atheroma, pernicious anemia, and embolism of the arteria centralis. The hemorrhagic effusions, with narrowed, tortuous arteries, and disseminate fatty deposit, may result from auto-intoxication, especially of intestinal ptomaines.

The ophthalmoscopic diagnosis, therefore, of Bright's disease, while sometimes of great importance, requires expert judgment, and can never be made until the renal diseases has already reached a dangerous stage of advancement.

THE PATHOLOGY OF BRIGHT'S DISEASE.

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Pathology is the doctrine of disease and signifies a morbid change, either in exercise of functions or in texture of organs. By Bright's disease, pathologically speaking, we usually understand a morbid change in the texture of the kidneys so material as to modify or suspend their function, whose office in the animal economy is, eminently, elimination. Our discussion, on account of limited time, shall be nearly confined to this narrow field. However, we should not be deluded, for the pathological domain of Bright's disease is so broad that it involves lesions of texture and derangements of function, more or less, of the whole organism. In fact, the toxines which the kidneys fail to separate from the blood not only primarily poison the blood, but make it a vehicle to reach all the other tissues and do them injury.

An accurate knowledge of the pathology of Bright's disease is absolutely essential to interpret the symptoms and direct the treatment. But it is necessary to acquire a knowledge of the physiology and histology of the kidney to gain a clear conception of the pathology. Briefly, the

physiology of the kidney is to eliminate from the blood various toxic substances which result from normal metabolism, as well as foreign toxines that may have gained entrance. The study of the histology of the kidney is a study of the mechanism by which said elimination is accomplished. The kidney may be likened to a double filter, or a filter with double or two funnels. A filter, or *filtrum*, is any porous material through which liquid is passed to separate it from matters suspended in it. To filter, then, is to purify liquor by passing it through an apparatus which separates any extraneous, impure, or feculent matter. The filtrate is the filtered or purified liquid. In the present application it is the *blood* in the renal vein, and not the *urine*, as indicated by some authors. No less an authority than Brunton[1] misapplies the term *filtrate* in this connection. The blood which is to be purified is conveyed to the kidney through the renal artery, and returns from it through the renal vein, filtered and purified. The impure products of tissue-waste and extraneous matter pass out through the uriniferous tubules. Therefore, the structure of the kidney, whose function is to purify and purge the blood, represents a filtering apparatus. The arterial capillaries or glomeruli, the capillary plexus of veins, the uriniferous tubules and lymphatics constitute the porous material; the fibrous capsule enclosing the kidney is the container of this porous material; the renal vein represents one funnel, returning the filtrate or purified blood; the ureter represents another funnel, conveying from the kidney to the bladder, in watery solution, as urine, the extraneous, feculent, defecated impurities separated from the blood. The arterial capillaries are derived from an afferent branch of the interlobular artery, which is a branch of the renal artery, and are disposed in coils, forming glomeruli or tufts, surrounded by a capsule (Bowman's) which begins the uriniferous tubule. Said arrangement of capillaries in glomeruli is for the double purpose of gaining greater surface and securing increased blood-pressure to facilitate the mechanism of filtration. Bowman's capsule is the beginning of a long, convoluted tube, which is lined with epithelium, whose function is the final transformation of the tissue waste-products of metabolism, or the secretion of the solid constituents of the urine. This epithelium serves another and equally important, though negative, function, *i. e.*, under physiological conditions it prevents the escape of serum-albumin and other normal constituents of the blood. The filtering and secreting capacities of the uriniferous tubules are not only increased by their length

[1] Brunton, Disorders of Digestion, '93 edit., p. 316.

and convolutions, but their caliber, having several alternating dilations and constrictions, retards the flow of the fluid to be filtered, and permits more time for completion of function—no small favor to a crippled or overworked kidney.

The uriniferous tubules are surrounded by lymphatics and a capillary plexus of veins, the latter emanating from the efferent arterioles of the glomeruli. The purpose of said structural relation is to provide further opportunity for the action of the renal epithelial cells. These cells absorb any excess of water or superfluous salts that may have filtered into the tubule through the glomeruli, and give them back to the lymphatics and veins to be returned to the organism to serve other vital processes in the economy. These cells also absorb from the lymph spaces and the venous plexus the products of disassimilation, or tissue-waste, most of these having been already transformed into urea by the liver,[2] and complete the transformation or secretion, which is excreted as the solid constituents of the urine.

This brief review of the physiology and histology of the kidney is given, not with the view of drawing fine theoretical distinction of the different forms of Bright's disease, but simply as a practical aid in studying the pathological changes in structure, and in interpreting the characteristic clinical phenomena occasioned by said morbid changes in their usual sequence of occurrence, to wit: Albuminuria, dropsy, and uremia.

1. *Albuminuria.* Before we get true albuminuria a morbid change in the vascular walls of the capillaries and the epithelium of the tubules is absolutely essential.

Experiments have proven that increased pressure effects alone are not sufficient cause. Ligation of the aorta below the renal arteries, notwithstanding it greatly increases blood-pressure in the glomeruli, does not produce albuminuria. Why? Because nourishment is amply provided by the increased blood-supply, and while the increased blood-pressure increases the positive function of the kidney—that of secretion, it does not impair its negative function—that of preventing the escape of serum-albumin, so long as nourishment is supplied and the renal tissue remains normal. Moreover, the increased pressure in the glomeruli is compensated for by the collateral circulation in the kidney. There are three channels by which the blood may reach the renal vein without passing through the glomeruli: First, the terminal branches of the renal

[2] Davis, Med. Record, September 15, 1900, p. 415.

artery anastomose with the stellate veins beneath the capsule, on the surface of the cortex; second, branches direct from the interlobular arteries, together with branches given off from the afferent arteries before they reach the glomeruli, anastomose with the venous plexus surrounding the tubules; and third, the *arteriæ recta* anastomose with the *vasa recta.* Through these three channels the blood-pressure in the glomeruli is relieved. However, when the renal vein is ligated we do get albuminuria. The explanation is that the blood-supply being stagnated, nutrition is deficient, and the texture of the renal structure is changed. Increased blood-pressure, under these conditions, will cause albuminuria. The pressure is first felt in the venous plexus and then in the glomeruli, and being little or not at all compensated by collateral circulation, the blood having no avenue of return to the system, the albumin that is poured out into the lymph spaces surrounding the tubules can not be absorbed by the venous plexus on account of increased internal pressure, nor can it re-enter the glomeruli for like reason, therefore it is forced into the tubules to escape with the urine. *Venous congestion*, then, does cause albuminuria, but there must first be a lesion in texture before it is operative. I wish to note here that the venous congestion of Bright's disease is due to a weak circulation. The soft, feeble pulse is what we have to fear, and not the high-tension, wiry pulse of arterio-sclerosis. The latter often is a complication, being produced probably by the same agent that caused the Bright's. The cardio-vascular change produced by Bright's is one of *degeneration*, and results in a weak heart and a soft, compressible pulse, which must not be confounded with the rigid, wiry pulse of *arterio-sclerosis* that not infrequently complicates the incipient stage of chronic Bright's disease. I wish to emphasize this differentiation.

2. *Dropsy.* The presence of fluid in the cellular tissues, *i. e.*, edema or dropsy, is influenced by three conditions: (1) Alteration in the composition of the blood; (2) alteration in the structure of the capillaries; (3) alteration in the vaso-motor nerves which control the capillary circulation. Normally there is a constant exudation of fluid from the capillaries into the lymph spaces to supply nutriment to the cells of the various tissues of the body, and after it has served this function it is reabsorbed by the veins and lymphatics. Under physiological conditions the exudation and absorption are equal, but when, from any cause, the exudation is increased and the absorption is decreased and accumulation ensues, if it occurs in the cellular tissue it is termed edema, but if in a serous cavity it is called dropsy.

(1) Alteration of the blood, or anemia of Bright's disease, is caused by albuminuria. Serum-albumin, which is one of the most important ingredients of the blood, escapes with the urine instead of remaining to minister to the nutrition of the blood and body. The red blood cells suffer, too, for hemoglobin contains not only hematin but also an albuminous substance, globulin, and, the latter not being supplied, the blood is further impoverished. Albuminuria, then, by causing anemic or watery blood, proves a pathogenic factor in dropsy, but hydremia alone is not sufficient to produce dropsy if there is not an alteration in the capillaries first.

(2) Alteration in the texture of the capillaries, however, renders exudation through them more easy, and, after all, the main factor in the pathogenesis of dropsy resolves itself into the condition of the capillary vessels. Experiments of rendering the blood watery by intravenous injection of large quantities of normal salt solution have proven that exudation is not increased so long as the capillaries are in a healthy condition. Capillaries altered by inflammation or lack of nutrition are rendered more permeable, and then any alteration of the density of the blood by dilution is quickly manifested by increased effusion. Diluted or hydremic blood, though it does not pass through healthy capillaries more readily than does the normal blood, yet it effuses much more easily through altered capillaries than does normal blood. Therefore, albuminuria not only alters the blood, but through the blood-change alters the capillaries, and when the structures of the vessels are altered hydremia greatly increases the edema.

(3) Alteration in the vaso-motor nerves influences the pathogenesis of dropsy. Exudation takes place slowly and absorption rapidly when the vaso-motor nerves are acting powerfully ; and, *vice versa*, exudation takes place rapidly and absorption takes place slowly when the vaso-motor nerves are acting feebly. Vaso-motor weakness, then, favors dropsy in a double manner, both by increasing exudation and retarding absorption. Albuminuria causes the vaso-motor weakness by withdrawing nutrition.

To summarize the pathogenesis of dropsy we may state briefly that albuminuria, by withholding nourishment, produces (*a*) an alteration in the composition of the blood, or anemia and hydremia ; (*b*) an alteration in the texture of the capillaries ; (*c*) an alteration in the condition of the vaso-motor nerves which control the circulation and the exudation and absorption by the capillaries.

3. *Uremia.* A full discussion of the pathogenesis of the complex,

morbid phenomena of Bright's disease hidden under the term uremia, especially implicating the nervous system, both sensory and motor, and complicating the muscular, respiratory, circulatory, and gastro-intestinal systems, also involving special organs, as the eye, skin, liver, etc., can not be embraced in so short a paper. The organism in its normal as well as in its pathological state receives and forms poisons, and the renal function affords the chief means of emunction, as the kidney can eliminate all toxic products except gas. Uremia is a mixed form of poisoning due to many causes, and we can not offer one explanation alone for all the accidents of bad repute which may appear in the course of Bright's disease. Several pathogenic theories have been invented seeking to identify these accidents with certain anatomo-physiological conditions, appealing to clinical observations to justify their arguments. One investigator has incriminated urea as a cause of uremia; another has invoked cerebral edema as an explanation; some accuse ammonia; others still claim potass., coloring matters, and extractive substances, as uric acid, creatin, leucin, xanthin, etc., precipitate all the accidents of uremia. All these theories may possess an element of truth, for the most rational explanation of uremic phenomena and most in harmony with clinical and experimental observations is that they are the result of not any single element of the retained waste-products, but of the entire mass. An analysis of normal urine reveals the presence of several poisons, which renders it difficult, if not impossible, to differentiate and estimate the pathological potentiality of any particular one, two or more of these poisons that the kidney may fail to eliminate.

What is of more import to the clinician is to remember that to invoke uremia it is not sufficient that the kidney should be diseased. It is essential that there should be so great lesion of texture that its functioning power is decreased to such a degree that it can not eliminate in twenty-four hours the amount of poison which the organism forms in twenty-four hours. When we consider that the utmost capacity of the normal kidney for twenty-four hours, as compared to what it ordinarily secretes in that time, is in the ratio of about ten to one, we can appreciate the degree that it may be pathological in structure, and yet, clinically speaking, may be physiological in function. This observation emphasizes the unreliability of urinary tests alone in diagnosing Bright's disease, for a kidney may be markedly diseased and the urine remain normal in quality and quantity. However, under these conditions, complications of other diseases might precipitate intoxication, therefore frequent urinary tests

and a close vigil for other clinical manifestations are necessary if we would not reproach ourselves for serious and fatal accidents, the outcome of intoxication arising from the suppression of the renal function to which we apply the term uremia.

DIAGNOSIS OF BRIGHT'S DISEASE.

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To me has been assigned the pleasant task of briefly setting forth the diagnosis of Bright's disease, a name that to the medical mind means albuminuria and its complications, acute and chronic, while the average layman understands it as the messenger of death. It is a term definite enough for general use, but too comprehensive for scientific or diagnostic purposes.

Acute Bright's disease, or acute nephritis, is nearly always a secondary symptom or complication of some form of septic or infectious disease, and is degenerative in character. There may be a history of cold, as in so many acute diseases, but generally it is a sequel of diphtheria, scarlatina, tonsillitis, rheumatism, severe hemorrhage, prolonged suppuration, pregnancy, and in aged persons it follows the excessive use of food and liquor without sufficient exercise.

Edema, generally the first subjective symptom, usually makes its appearance in the face under the eyes, and is rapidly followed by general anasarca. It is sudden in its onset, accompanied by pains in the back and lumbar region, great weakness, rapid pulse, loss of appetite, and marked pallor of the skin. The urine is greatly decreased in quantity, high in color, containing albumen in abundance, also blood-cells, renal casts, and epithelia.

Albumen in this form of Bright's disease may be considered as both diagnostic and prognostic factors of great importance. Chronic Bright's disease, or chronic parenchymatous nephritis, is generally a disease of advanced age, is insidious in its approach, and marks the departure of good health. The tendency to anasarca is early, prominent, and persistent. Anemia is marked with pallor of the skin. The urine is scanty and of low specific gravity. Albumen is nearly always found at some period of the day, though it may require repeated tests to prove its presence.

The microscope is of more importance than the test-tube, revealing as it does renal casts and epithelia. The pulse is rapid with high tension. Respiration is rapid with moist cough and dyspnea upon exercise. Insomnia and loss of appetite and mental depression may be early or late symptoms of the disease.

Chronic interstitial nephritis is another form of chronic Bright's disease, marked by the passage of large amounts of pale urine of very low specific gravity in which albumen is very scant or absent entirely, most frequently to be found in the first urine voided in the morning. The microscope reveals hyaline and granular renal casts and cells. The patient is far advanced in life or prematurely aged from high living, use of liquors, overwork, or mental worry. The pulse is of high tension and irregular, frequently made worse by disease of valves and arteries.

Respiration is impeded by moist râles, pulmonary edema, shortness of breath, especially marked at night.

THE TREATMENT OF BRIGHT'S DISEASE.

A. G. BLINCOE, A. M., M. D.

BARDSTOWN.

This paper is presented not because of any special fitness I feel that I possess for handling the subject, but simply for the reason that I was asked to write it and did not like to refuse the request. In its preparation I have drawn freely from the writings of others on this disease, but, as I was asked "to let my paper be just five minutes in length," I shall only endeavor to give as briefly as possible the outlines of treatment as they occur to me from my reading and experience, and trust to the able gentlemen who will follow me in the discussion to amplify the subject, elucidate the obscurities due to brevity or other causes, correct defects generally, and freely criticise any views thought to be erroneous. Were it not for this view of the matter and under these circumstances, I should scarcely feel inclined to attempt to present a paper on this subject at all.

The first and most important measure to be adopted in the treatment of acute Bright's disease is complete rest in bed in a comfortable room,

where the patient is to be kept perfectly quiet and warm with sufficient bed covering, including blankets and woolen or canton flannel underwear, and carefully guarded from draughts of air. This, with proper attention to diet, the skin, and bowels, may be about all the treatment necessary in mild cases, and none of these measures should ever be omitted in any case.

The diet, from which should be excluded all solids, and especially meat and eggs, should at first be light and consist mainly of milk or buttermilk, to which may be added by way of variety gruels, soups, rice, oatmeal, etc., but "It is better, if possible, to confine the patient to a strictly milk diet." (Osler.) The patient should be allowed to drink freely of water or lemonade or the carbonated or alkaline mineral waters. A teaspoonful of cream of tartar to a pint of boiling water with the juice of half a lemon and a little sugar, taken cold, makes a pleasant and useful drink. "The fluids keep the kidneys flushed and wash out the debris from the tubes." (Osler.)

A saline purgative should be given in the beginning, cream of tartar or magnesia being suitable for children and Epsom salts for adults. Should the stomach be intolerant of the latter, an effervescing saline or compound jalap powder or elaterium may be given. Afterward a dose of salts or an effervescent saline each morning in sufficient doses to keep the bowels well open.

If there is pain in the back, hot fomentations or dry cups followed by poultices may be applied. Wet cups should not be used with children, and, if used with adults, all the usual antiseptic precautions should be observed. Besides being open to the same objections as wet cups, "Blisters are not advisable; as the irritant substances producing them may be absorbed and cause increased renal irritation." (Hare.)

For hematuria and scanty or suppressed renal secretion, besides the local applications to the loins already mentioned, sweating by means of the hot-water or hot-air bath or hot wet pack should be tried. The latter is generally more convenient, equally efficient, and less enervating than the other methods mentioned. In using it the bed should be protected by a rubber sheet over which is placed a dry blanket. Remove all the clothing and wrap the patient with a blanket wrung out of water at 110° F., and over this place a dry blanket and put an ice-cap to the head to prevent cerebral congestion. If the results seem favorable, the patient may remain in the pack an hour, and the same procedure may be employed once a day as long as indicated. Should the temperature, however, rise, as indicated by a thermometer under the tongue, and no

sweating occur, at the end of half an hour the patient should be removed from the pack. One eighth of a grain of pilocarpine hypodermatically may aid materially the diaphoresis, but it is a dangerous remedy which should be used with caution if at all. It should not be given unless the pulse is strong. It may be guarded with strychnia. If there is much dropsy, the hypodermics may not be absorbed. Purgatives may also be used either alone or in combination with the sweating, as the main reliance in these cases is to produce elimination by the skin and bowels, the kidneys failing to respond to diuretics. The stimulating remedies of the latter class are inappropriate, as they act as irritants to the already inflamed organs. Alcoholic stimulants are objectionable for the same reason. Later on, if the pulse is soft and heart-action weak, digitalis in small doses in combination with the citrate, acetate or bitartrate of potash, or the benzoate of soda and the diluents already mentioned, may be used as diuretics.

Dropsy is to be treated by hydragogue cathartics, salines in concentrated solution or elaterium, and the diaphoretic measures above mentioned, and if need be by punctures or the use of Southey's tubes. A fine aspirator needle may be used and the liquid carried away by means of a rubber tube attached. Here, again, we should bear in mind the principles of asepsis. In dyspnea, on account of pleural effusion, paracentesis may be resorted to. In edema of the lungs a full dose, one sixtieth of a grain, of atropia should be given hypodermatically. In edema of the glottis, not relieved by hydragogue purgatives, diaphoretics, and inhalation of steam, scarification or possibly intubation or tracheotomy may have to be resorted to. I recently saw a case of edema of the glottis in a man eighty years old who was the subject of Bright's disease. He was soon relieved by saline cathartics, diaphoretics, and the inhalation of steam from a pitcher of hot water.

Vomiting may be treated by reducing the nourishment for a time to small quantities of limewater and milk, the use of crushed ice or hydrocyanic acid and bismuth.

If uremic coma should supervene, active purgation by means of elaterium or croton oil should be tried. One fourth of a grain of elaterium in solution should be given and repeated in an hour if necessary. If patient swallows with difficulty, it may sometimes be given by mixing it with a third of a teaspoonful of butter and placing it far back on the tongue. The dose of elaterium, which should be dissolved in alcohol or whisky, is one sixteenth of a grain. Should we fail to get the patient to swallow the elaterium, two drops of croton oil may be dropped into the mouth

undiluted. If the pulse is full and strong, blood-letting may be used, and this may be followed by the use of the normal salt solution. One or two pints slowly injected subcutaneously is said to be a great aid to elimination as well as to weak heart-action. This may be repeated, if necessary, every six to twelve hours. If it is not convenient to use the solution hypodermatically, larger amounts may be slowly injected into the rectum. These measures, hypodermoclysis and enteroclysis, may be used without the venesection in cases of weak heart-action. In some cases of contracted arteries when blood-letting from any cause is not used, nitro-glycerine may be given with benefit. It acts by dilating the peripheral blood-vessels and bleeding the patient, so to speak, into his own capillaries. The hot wet pack and the diaphoretic measures already mentioned are also appropriate remedies in coma.

In case of convulsions, chloroform by inhalation may be used to control them while waiting for the effect of other remedies. Bromides and chloral may be given if patient is able to swallow. If not, a dram of bromide of potash or soda and half a dram of chloral in three ounces of starch-water may be injected into the bowel. The remedies just mentioned for uremic coma, hydragogue purgatives, venesection, diaphoretics, and the normal saline solution, may be used singly or conjointly, as the judgment of the attending physician will decide best in each case. Should several or all of these remedies be used without avail, or should it seem undesirable to wait on them, a full dose of morphine hypodermatically may be given. While there seems to be some difference of opinion in regard to the use of morphine in uremic convulsions, in my own experience I have seen from its use in these cases nothing but uniformly good results.

After the acute stage of Bright's disease has passed, when the patient is left weak and anemic, supporting measures are indicated, and especially the iron preparations. The tincture of the chloride, or, if a more diuretic preparation is desired, the Basham's mixture, may be given to adults, and syrup of iodide of iron or syrup of phosphate of iron to children. Digitalis, strychnia, or caffeine citrate may be used as heart tonics if they seem indicated. During convalescence an increase in the amount of food and the change to a meat diet should be gradually made. Meat should be withheld until albumen disappears from the urine. The patient should be warmly clad with flannels next the skin and avoid exposure to atmospheric changes, and take the greatest care to prevent a relapse.

In chronic parenchymatous nephritis, the treatment already outlined,

judiciously followed, will meet most all the requirements. Warm clothing, care in diet and exercise, avoidance of exposure to cold, the use of simple diluents, saline laxatives, iron for anemia, digitalis, strophanthus, strychnia, and caffeine for weak heart, and nitro-glycerine for contracted arteries, properly used, with treatment of complications, constitute the chief indications. Tyson cautions against the too free use of iron, especially in the chronic interstitial form of the disease. Hare suggests one to three-drop doses of tincture of cantharides three times a day for the atonic condition of the kidneys that sometimes occurs in the later stages. Anders advises lactate of strontium for the same purpose.

I have been told by two of my medical friends that they have used a preparation of urotropin and salicylic acid in two or three cases each of chronic Bright's disease with apparent benefit. One of them says the preparation seemed to increase the amount of urine, diminish the albumen, reduce the dropsy, and relieve the headache. I did not learn whether this remedy seemed to act best in the parenchymatous or interstitial form of the disease.

In chronic interstitial Bright's disease the same care as regards hygienic and dietetic measures should be observed. The milk diet may be tried. Residence in a warm climate like that of Southern California or Florida is advisable. Patients often seem benefited by a visit to certain watering-places. The waters, however, are seldom curative, but simply act as the diluents already mentioned. The only remedies likely to have any curative value in this disease are the iodides and mercurials when there seems to be a syphilitic causation. The various symptoms should be treated as they arise. For the high arterial tension indicated by a hard pulse, throbbing headache, and flashes of light before the eyes, if persistent and not relieved by saline purgatives and sweating, nitro-glycerine, one drop of the one-per-cent solution every three hours, increased if necessary, often acts well. "Its value is seen not only in the reduction of the tension, but also in the striking manner in which it relieves the headache, dizziness, and dyspnea." (Osler.)

When there are signs of cardiac dilatation, shortness of breath, scanty urine, and local dropsy, digitalis in ten-minim doses three or four times a day, with saline laxatives in the morning, should be given. Strychnia may sometimes be given with benefit in these cases. I have sometimes combined the two tinctures of digitalis and nux vomica, mixed in equal proportion, with good effects in such cases.

The treatment of uremic coma and convulsions has already been

given. The minor manifestation of uremia, such as restlessness, mental wandering, foul breath, coated tongue, headache, palpitation, feelings of numbness, and nocturnal cramps are to be treated in the same way—saline purgatives, hot baths, and nitro-glycerine to reduce tension. Osler says: "For the restlessness and delirium, morphine is indispensable. Since its recommendation in uremic states some years ago by Stephen McKenzie I have used this remedy extensively, and can speak of its great value in these cases. I have never seen ill-effects or any tendency to coma to follow. It is of especial value in the dyspnea and Cheyne-Stokes breathing of advanced arterio-sclerosis."

OPPOSING THE ROUTINE REGIMEN ADOPTED IN THE MANAGEMENT OF CHRONIC BRIGHT'S DISEASE.

LEON L. SOLOMON, A. B., M. D.
LOUISVILLE.

In preparing this short paper it has been chiefly my aim to call your especial attention to several salient facts, namely, first, in the management of a given case of so-called chronic Bright's disease (without stopping now to differentiate between the several inflammatory and degenerative types which mark a great difference in the exact pathological anatomy of the case) it is always essential to remember that the slow smouldering fire may from time to time become a bright red flame; in other words, to care for a chronic exudative nephritis or a chronic interstitial nephritis (so-called non-exudative) is to manage the respective acute exacerbations which will occasionally occur in the course of these two chronic ailments. Second, to relieve the kidneys of all possible overwork—on the the one hand by a carefui regulation and supervision of the habits of life, the diet, clothing, baths, exercise, sleep, stool, etc., and to restore and preserve the proper excretory function of the organ—is an all-important duty, which, if accomplished, may mean for our patient many months, if not years, which he may often spend in the quiet and peaceful enjoyment of life, and in fair health. Third, let us remember the presence or absence of albumin in the urine is not all of Bright's disease, though the case can often be approximately measured

and the prognosis fairly estimated and gauged by this important adventitious ingredient.

I am convinced that we are often guilty of managing Bright's disease in a routine if not desultory fashion; in attaching to the presence of proteid matter in the urine, with or without the additional presence of renal derivatives (as revealed by the microscope), too much importance, and of reaching too positive and convincing conclusions that the patient is doomed to sooner or later meet his just retribution in a different atmosphere, simply because of this one ingredient; and then when the diagnosis is once fairly fixed, I make bold to admit we are very often too lax in the regimen we adopt for the future welfare of the case. A work carelessly done were often better undone or not done. This statement particularly applies to the management of morbus Brightii, which, though the morbid process itself rarely requires or even justifies vigorous measures, surely is always deserving of careful and individual treatment. It is not my province, in this symposium which your secretary has arranged, to discuss the etiology of any of the Bright's diseases, but in so far as certain causative factors have their positive bearing on the therapy of the disease, I wish, at least, to mention several.

It has been said by Prof. George Johnson that renal degeneration is a consequence of long-continued elimination through the kidneys of products of faulty digestion, and since his time it has been demonstrated conclusively that the elimination of products of malassimilation is productive of granular degeneration in these organs. Fothergill looked upon liver incapacity favoring faulty digestion and assimilation as the foremost etiological factor, to which Allbutt added mental worry and overstrain (by arresting secretion) as most likely to provoke such incapacity. Furthermore, we are now aware that over-indulgence in animal food is a direct cause, and that excrementitious products in the circulating fluid, such as are present in tuberculosis, syphilis, diabetes, gout, chronic rheumatism, scarlatina, measles, diphtheria, etc., are each of some moment in at least starting the process or predisposing to it, and our therapy is incomplete if it does not recognize the part these one or more etiological factors play. It is, then, not sufficient to instruct the patient to avoid condiments and highly seasoned foodstuffs, nor viands, nor to restrict the amount of meat and institute a skim-milk diet, or some other plan, but the whole dietary and habits of life must be interpreted for the patient, and as carefully studied as is now done by the Walker Gordon laboratory method devised by Professor Rotch for

selective infant-feeding. Ordinarily it is wise to restrict the meat diet, allowing only white meat in small quantity, with fish; also soups, broths, gruels, and fruits in abundance, but no greater error, it is now considered by text-books on dietetics, can be committed than to compel the general run of sick people—diabetics, for example—to adopt a fixed, inflexible diet list; and this applies also to Bright's, for is it not found that some cases not only tolerate but actually thrive on certain prohibited and interdicted articles of food?

Now, just so wide a scope of latitude as characterizes the case of glycosuria with reference to food also asks for consideration when the case of Bright's is before you. And just here I wish to emphasize the frequent good from the administration of fats, which not a few of the cases we meet can readily digest and assimilate. It must be borne in mind that our therapy is useless in the constitutional diseases if, notwithstanding, nutrition suffers and strength fails. Every fifteen grains of fat assimilated results in nine calories of heat, transposable into energy or vital force; the same amount of carbohydrate yields but four calories, and by the strict routine regimen we are prone to remove the greater per cent of albuminous food, which yields a like four calories for each fifteen grains assimilated. Stop, I ask, long enough to make a calculation. Man is but an engine; he requires 2,500 to 3,000 calories to run him from 4 o'clock to-day to 4 o'clock to-morrow, or through any other given twenty-four hours. Whence the source of this energy? Where is he to get his units if you deprive him of the raw material wherein latent energy resides?

Finally, to sum up the meaning of this paper, I ask for the case of Bright's not only a consideration of the points made, but a keener appreciation of the influence exerted by the disease on the blood-pabulum proper (with its consequent profound anemia), and also on the heart-muscle and arteries, and if these receive your vigilant attention I am constrained to say the therapy of chronic Bright's disease is otherwise, as a rule, simple.

DISCUSSION ON THE PAPERS OF DRS. REYNOLDS, DAVIS, SARGENT, BLINCOE, AND SOLOMON.

Dr. J. B. MARVIN, Louisville: Not having heard the papers read, it is impossible for me to discuss them properly. I am, however, more than convinced that what we now call Bright's disease will in time be recognized as being the result of an infection not so much chemical or inorganic, but the result of the elimination of toxines by the kidneys. That leads to the broad general thought, the necessity of recognizing this fact in trying to ward off acute nephritis as a sequence of many of the so-called infectious diseases. It is a fact not generally recognized that in at least 25 per cent, and perhaps 50 per cent, of cases of typhoid fever, the urine contains the typhoid bacilli. Every tyro has heard about the destruction and disinfection of the fecal discharges in typhoid fever, overlooking the fact that the bacilli in the urine are quite as frequently and unquestionably the cause of certain outbreaks. I have seen one or two cases this spring which bear out this same general thought. They were cases of grip with tonsillar trouble; grip with uremic symptoms; cases confined in bed, yet coupled with an acute nephritis, proving what I said in the beginning—toxines and not drink. The cases the most fatal, the most insidious, and the most difficult to manage because they are so frequently overlooked, are that form of Bright's disease so easily overlooked by the ophthalmologist, the interstitial nephritis. I believe that perhaps a large percentage of these cases die, not at the kidney, but in the head or at the heart. We overlook the disease when there is no dropsy, no ascites, but gastric symptoms, a few intestinal symptoms, patient easily tired, anemic, run down, neurasthenic, overlooking the fact that the change is going on in these kidneys. Like a clap of thunder out of a clear sky the man has a stroke of apoplexy, and then we do not know what is the matter with him. Examine the urine more carefully; it ought to be more frequent and general than it is; the absence of albumin and casts does not justify you in ruling out this trouble. I have learned as the result of considerable experience that urine abundant in quantity and persistently low in specific gravity is always an omen of evil.

Always watch the heart. An hypertrophied heart is all right. A man does not die until his heart begins to dilate; bear that in mind.

The treatment, diet, rest, air, and proper management. I allow my patients more diet than the books seem to countenance. I give any kind of farinaceous food, milk, eggs, and fish. As to the medicinal treatment, there are two remedies among the great host of diuretics which are of real value in this condition—they are diuretine and urotropine. The first in from five to fifteen grain doses will very frequently stimulate a flagging,

dilated heart and rapidly reduce that worst of all symptoms, a water-logged condition of the system. It is far better than calomel, digitalis, and a host of other remedies. It will bring a man right out of failing condition and put him on his feet again for some time. In all these conditions the safety of the patient lies in having an acid urine; that is the best protection against the infection of the urinary tract. The urotropine heads the list of remedies for keeping the urine acid. The judicious use of these two remedies have, in my experience, produced wonderful results. Patients who were almost *in extremis* have been able to be up and around within two weeks after the beginning of this treatment.

Dr. S. G. DABNEY, Louisville: I presume I am to discuss the subject from the standpoint of the oculist. Dr. Reynolds covered that ground very fully, and has left little room for a difference of opinion, so that I can merely corroborate what has been said, and possibly call attention to a few points not mentioned by him. Vision is not always interfered with. The patient may have perfect sight even with extensive changes in the eye. Patients have often been referred to me on account of severe and continued headaches, with no other symptom suggesting Bright's disease. The headaches were naturally supposed to be due to a refractive error. In testing their eyes for glasses I was surprised to see in the retina the picture indicative of Bright's disease. I saw two cases in one family, both of which were first diagnosed by the ophthalmoscope, and both of which terminated fatally.

A physician of this city consulted me a few years ago for deficient sight. He was between fifty and sixty years of age, and I was under the impression that all he needed was a readjustment of his glasses. An examination of his eye showed unmistakable evidences of Bright's disease. I was somewhat at a loss as to what I should tell this doctor, but finally came to the conclusion that it was best to tell him the whole truth. I then told him that he probably had Bright's disease, and suggested that he have his urine examined; this was done, and my diagnosis was confirmed. He died within sixteen months afterward. At the time of his visit he also told me that his daughter, a young lady of twenty, had come to Louisville on account of severe headaches. She also went to an oculist, who told her she had albuminuric retinitis. She died in the course of the following year.

The retinitis of albuminuria often occurs with fairly good sight, and very often in the absence of other distinct symptoms of Bright's disease. We may mention three distinct types of ocular involvement in this disease. The one most frequently seen is where there are grouped around the fovea, in a radiating manner, dull whitish spots; they radiate out somewhat like the spokes of a wheel. In another group we find fewer of the spots, and in the third variety we see neither the spots nor is the nerve involved. The first is by far the most distinctive.

Retinitis albuminurica occurs most frequently in the shrunken kidney; it is also frequently seen in the albuminuria of pregnancy. It is important to note that the albuminuria of pregnancy is by no means as bad as the albu-

minuria accompanying Bright's disease. Many oculists have seen the albuminuria of pregnancy, attended with perfect sight, recover.

It is extremely difficult to estimate, with any degree of exactness, the percentage of cases in which we find this complication of Bright's disease, because comparatively few cases of Bright's disease are subjected to an ophthalmoscopic examination. The percentage usually given is from 9 to 35 per cent, but I am convinced that if the eyes of all these cases were examined we should find a much greater proportion than that.

In attempting to make a prognosis, the retinal involvement is of greater importance than in the diagnosis. It is an extremely sad thing to see these cases, because death is certain to follow inside of eighteen months; still I remember having had under observation two cases which outlived this period. One was a young man of thirty, who lived for six or seven years after the retinal complication was diagnosed, and was able to go on with his work. The grave prognosis in these cases depends largely on the fact that the involvement of the retina invariably occurs in the later stages of the disease. The use of the ophthalmoscope in this connection always reminds me of the words of Dr. Loving, who said that "it enables us to walk into nature's laboratory; it enables us to read the hidden troubles of the brain, heart, and kidneys."

Dr. ———, of ———: I have been interested in the study of Bright's disease for some time, and I have often been convinced that the chemical and microscopical examinations of the urine are too frequently overlooked. I agree with what Dr. Marvin said in regard to that, because if more frequent examinations were made we would not overlook diseases of the kidney as often as we do. We go on and treat troubles without recognizing the underlying pathological conditions, when an examination of the urine would soon enable us to ascertain where the trouble lies before the kidney symptoms are more clearly manifested. I have often been led to a diagnosis of renal troubles by making a chemical and microscopical examination of the urine, when I could not have done so by other means.

The condition is not due to a single chemical poison, but to a number of them, many of which are unknown. It is not the albumin which causes the trouble, it is not the salts that cause the trouble, but a combination, and I am convinced that the most frequent salt which is responsible is potash. It is the most important at any rate, and it is the most frequent. It can always be found in large quantities in the urine of a case of Bright's disase.

Dr. J. G. Carpenter, Stanford: The subject of Bright's disease teaches the general practitioner not only the importance of the urinary analysis, but also that he should be an ophthalmologist. When we study the eye with the ophthalmoscope we are enabled to deduct exact conclusions from our examination. We know the stage and the variety of the disease. Therefore I would suggest that every practitioner be perfectly familiar with the use of the ophthalmoscope.

It was my good fortune to study a number of cases of albuminuria of

pregnancy, patients with no other form of albuminuric retinitis, in which after delivery, and even before treatment, you could see the salutary changes taking place in the retina, and although these patients have been practically blind, yet by proper treatment, after confinement, I have been able to see the retina clear up. Even the hemorrhagic exudations have all disappeared and the patient's sight returned to normal. That subject is one that has been neglected by the practitioner of the past, and women have become blind because the general practitioner is ignorant of the use of the ophthalmoscope. This does not only apply to the albuminuria of pregnancy, but also the albuminuric retinitis of Bright's disease.

Dr. THOMAS HUNT STUCKY, Louisville: The subject of Bright's disease is one of such magnitude that it is impossible to attempt a discussion of it in the time allotted. I simply desire to throw out a thought as to its possible etiology. I am led more and more day by day to believe that probably one of the great factors in the causation of Bright's disease is due primarily to the derangements in the gastro-intestinal tract. I believe that stercoremia, the poisons engendered within this tube, the frequent conditions of auto-infection and auto-intoxication, their constant recurrence placing as they do much increased work upon the kidney, act in that way as an irritant, producing a condition which otherwise would not occur. It strikes me as being perfectly reasonable to believe that where the amount of solid material excreted is increased, knowing as we do its powerful irritating influence, that there must necessarily be induced and produced an irritant within these glands which is bound to have a deleterious effect on the kidney.

I believe the early recognition of this condition by ophthalmologist is of far greater service to the general practitioner as a means of making a positive diagnosis of Bright's disease than the microscope in the hands of the average practitioner. I would prefer and abide by the opinion of the ophthalmologist every time.

Dr. WILLIAM BAILEY, Louisville: I desire to call attention to one fact which ought to be recorded. I believe the name of Dr. Allison ought to be associated with the use of salt solution, as he alluded to it so beautifully in his remarks last night.

Bright's disease presents nothing definite. The easiest method of studying the organic changes in the kidney and appreciating their significance can be learned by a study of the anatomical structure of the kidney. We can readily find cases involving one or more of the structures in the kidney. Frequently we find the acute Bright's disease involving the tubular structure and the secreting structures; in others the changes occur in the blood-vessels, and then, again, in both. In another variety, that one which is accompanied as a rule by early or prolonged dropsy, the changes take place in the connective tissue, producing what is commonly known as small contracted kidney.

Acute Bright's disease is a curable affection. Most cases recover. The

cases that we see occurring after the exanthemata, if we give them a fair chance, plenty of water, and keep them warm, will nearly all recover if there is only a slight involvement of the kidney. In other cases where this has become chronic—and allow me to say that chronic Bright's disease does not often follow the acute form—are the ones which we see most frequently. They are often subacute from the beginning, and have developed insidiously without the presence at any time of acute tubular inflammation.

As to the management, we must take into account the defective elimination. The kidney is purely and simply an excrementitious organ; it is doing that work alone, and is often called on to do more than its share of work, and it is therefore one of the most important organs we have. In the management of diseased conditions of the kidney we must aim to relieve the kidney of some of its work by calling on some of the other organs. Much can be accomplished by purgation, especially when the dropsical effusions are large, and by increased elimination through the skin, giving the kidney a rest and a chance to resume its function under proper circumstances and without stimulation. The best remedy is water, thoroughly flushing the kidney and relieving it of irritating poisons. The normal salt solution is often of value in the acute form of the disease and in the coma of uremia. It will accomplish more than any thing else. As an antiseptic of the urinary tract and to aid in getting rid of the toxines, I do not know of any better or safer remedy than urotropine, 5 to 8 grains every few hours. This will nearly always exercise a decided influence on the case. I am still fond, however, of a combination that was given to me many years ago for the treatment of Bright's disase where there is defective elimination. I refer to the acetate of potash and the infusion of digitalis.

Dr. REYNOLDS (closing the discussion): I consider this a very great subject, barely touched upon in the time we have been able to give to it. I would like to speak four or five hours on the subject of nutrition alone; on the subject of irritating foods as causes of organic renal disease. I believe asparagus kills thousands of people by producing renal disease; I believe that there are many other food products which are equally as irritating as asparagus. We do not know all of them. I believe the habit some people have of not drinking water is responsible for a great many cases, especially in persons who use large quantities of animal food highly seasoned, and more particularly still in that class of people who take too little out-of-door exercise, and consequently eliminate but little from the skin.

As to the modes of treatment, I regret that I shall have nothing to say on that subject because of lack of time.

As to the question of perfect sight in organic renal disease, I would like to say that in those cases of renal disease due to toxemia, which have already existed long enough to have weakened the arterial vessels, there is no such thing as perfect sight, or approximately perfect sight. In that other class of cases, the contracted kidney, which come on slowly and insidiously, and where the stellate arrangement of the fatty cells is found radiating from

the fovea centralis, I believe sight remains fairly good. I have seen some cases where there was no perceptible deterioration of sight until the perimeter was applied, when you find easily and very distinctly a valuable diagnostic helper. Any person of average intelligence can make a perimetric examination of the eye by going to a dark wall, drawing a circle on it, and, placing the patient's eye at a distance from the center of the circle equal to the radius of the circle, and excluding the eye from the sight, have some bright spot in the center, and have a piece of cotton rolled on a stick; pass this from the periphery slowly to the center, first in a vertical line, then horizontal; then bisect this, and you will have a fairly correct, if not absolutely correct, test of the field of perception. It is strange, furthermore, that the colors least likely to attract attention in color perception are the very colors to which the patient is blind, namely, yellow and blue. In a great many other forms and varieties of color-blindness the red and green disappear, while in this kidney affection the yellow and the blue are the colors. You can make the test with colored cottons in the same way; if you have a chart representing the field of vision you can easily map it out. If, for instance, the patient sees at twenty-five degrees from the center, but you do not have to determine that while you are making the measurement, as you can determine it by the size of the circle, dividing it into spaces of ten degrees each. You can then easily tell how much divergence there is from the center to the point of limitation, either in the white or color materials used in making the test.

As to the differentiation of any of the other forms of so-called Bright's disease, there are complications present in other varieties which make the ophthalmoscopic diagnosis less reliable. It is reliable only in that class of cases where the striated lines are found surrounding the fovea centralis.

Dr. Davis (closing the discussion): In discussing the pathogenesis of Bright's disease we have to deal with irritants or poisons which are conveyed by the blood, and which in the acute form of the disease are possibly infectious agents, such as germs, but in the chronic form the irritants are more probably the imperfectly transformed waste products of disturbed metabolism. These poisons, when brought to the kidney by the renal artery for the purpose of elimination, come in contact first with the glomeruli and irritate, inflame, and alter their walls so that the serum albumin of the blood escapes with the urine. From the glomeruli the poisons proceed along the efferent arterioles to the lymph spaces and venous plexuses, surrounding the uriniferous tubules, and come in contact with the connective tissue of the stroma and the epithelium of the tubules, producing an hypertrophy of the connective tissue and a degeneration of the epithelium. The latter change destroys the action of the renal epithelium, more albumen escapes into the tubules, and the power of the cells to absorb and complete the transformation of the waste products of metabolism into the solid constituents of the urine is impaired or lost, and said products remain in the blood. The blood in turn is deprived of its albumen and laden with

toxines; it is returned through the renal vein to the general circulation. This de-albuminized or hydremic and poisoned blood, by failing to supply nourishment and by direct irritation, acts in a noxious manner on the texture and vital functions of the cardio-vascular and nervous tissues, which is manifested by dropsy and uremia.

But whatever may be the etiology of these phenomena, whether infectious chemical irritants or incomplete waste products due to a pernicious disturbance of metabolism, I wish to hold clearly before you the fact that in Bright's disease there must be a primary morbid change in the vascular walls of the glomeruli and the epithelium of the tubules before we get clinical manifestations, as is evidenced by chemical changes in the urine and blood, and later by general symptoms, such as dropsy, uremia, etc. In other words, the filtering apparatus of the kidney (the glomeruli and tubules), which affects the mechanism of the filtration of the blood, must be so altered as to leak, and not only allows normal constituents of the blood, as serum albumen, to escape with the urine, but fails to separate from the blood normal constituents of the urine, such as urea, uric acid, salts, etc., and permits them to return to the system to poison it.

Dr. SARGENT (closing the discussion): As my paper was very short I shall take the liberty of calling your attention to conditions which we find in chronic interstitial nephritis. It has been truly said that troubles never come alone; that evils never cease to exist. It is so in chronic Bright's disease, and the physician who takes a narrow or contracted view of the disease will fail to make a diagnosis early enough to be of any practical benefit. The secretion from the kidney is not altogether an excretion; the excretion from the kidney is not altogether a secretion. When you find albumen in the urine, then you are just in the position to investigate all of the other organs of the body, and you will find that the kidneys are not alone at fault. You will find disease of the liver. If you will investigate further, the heart is apt to give you some information along that line; the capillaries are also diseased; the brain is involved; the lungs in a compensated way undertake to eliminate some of the secretions. You must investigate the eyes, the skin, and the intestines. There are a great many symptoms that we must take into consideration if we make the diagnosis.

As to diet, I must differ somewhat from one of the speakers. I believe we have in chronic Bright's disease a great waste of vitality, and after we have corrected all of the morbid conditions so far as we can, then I believe that an albuminous, nitrogenous diet comes nearer to restoring the vitality and strength of your patient than any other kind of food you can give him. In regulating the diet, we must always take into consideration the symptoms presented by the individual case, and decide accordingly. No one diet will answer for every case.

ANALGESIA FROM THE SPINAL SUBARACHNOID INJECTION OF COCAINE.

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LOUISVILLE.

The ideal anesthetic would be a drug capable of producing unconsciousness, with freedom from pain and loss of reflex muscular contraction, without danger to life or disagreeable and annoying symptoms. Such an agent will scarcely be found, for any drug sufficiently powerful to render a patient even temporarily oblivious to external influences must of necessity be dangerous to life. No one who has used anesthetics frequently will deny their danger, or the frequency with which serious symptoms are observed during their administration. It is owing to the dangers incidental to general anesthesia that a number of different methods have been tried with the view of lessening the chances of fatality. Researches of this character have developed local anesthesia to a remarkable extent, quite a number of drugs having been used for this purpose. Recently the local use of cocaine has been extended to the spinal cord.

Dr. J. Leonard Corning, 1884–1885, was the first to demonstrate the possibility of cocainization of the cord. Prof. Bier, of Kiel, was the first to use the method in a surgical way, while Tuffier, of Paris, has brought the subject prominently before the profession. Murphy, Matas, Fowler, Morton, and others of this country have employed it quite frequently for surgery, and Marx has used it often in labor, giving a flattering report. The number of reported cases is at present quite large, yet insufficient to give an accurate idea of the danger or the value of this method for the relief of operative pain. That analgesia can be produced in this way has been clearly demonstrated. Strictly speaking, cocaine is not anesthetic, as the sense of feeling is not entirely abolished. The questions for the profession yet to determine are the dangers incident to its use, its feasibility, the indications and contra-indications for its employment, the best strength of solution, and the amount to be injected. That cocaine so used will ever displace the general anesthetics I do not believe, yet my limited experience, considered in connection with the

reports of others, leads me to the conclusion that this method has a considerable field of usefulness. Let us consider the possible dangers from the injection into the spinal canal. First: The shock of tapping the cord and injection of the cocaine. Simple tapping of the spinal subarachnoid space is usually a safe procedure, still Gumprecht (*Deutsch Med. Wochenschrift*, June 14, 1900) has collected seventeen cases from the clinics of Quincke, Furbringer, Lenhartz, Lictheisen, Kronig, Bull, and himself in which death has quickly followed lumbar puncture for diagnostic purposes, in which fatal termination could be attributed to no other cause than this apparently trivial procedure. It must be remembered, however, that these were cases of disease, either of the cord or brain, and in some cases, at least, tumors of the brain were present. It is quite probable, also, that the amount of fluid withdrawn had something to do with these fatalities. Where only a small quantity is withdrawn the shock will be slight. The depression from the injection seems to be proportionate to the dose of cocaine.

Second: The danger to the cord and centers in the medulla. Sicard has demonstrated that the toxicity of the cocaine injection increases as the injection is made higher in the cord. According to Tait, Sicard, and Cagleri, the spinal canal is accessible as high as the sixth cervical space. Depressive action upon the medullary centers is extremely unlikely to occur if the dosage of cocaine is small and the injection made in the lumbar region of the cord, or rather the cauda equina. I have made the injection successfully in the tenth dorsal space of a child of nine. If the patient remains in the sitting posture for one or two minutes after the injection is made, there will be little chance for the upper part of the cord or the medulla to be affected seriously. Nicoletti (see Therapeutic Gazette, November 15, 1900), on the basis of an experimental research, maintains that these injections cause no anatomical alterations of the nervous elements. If he is correct, and the effect on peripheral nerves leads us to think that he is, the danger of paralysis and late effect upon the cord is very remote. The danger of hemorrhage into the canal from injury to one of the spinal veins by the needle must be very slight, yet a case is recorded where such an accident has occurred. (Case of Heumberg.)

Third: The action of cocaine upon the heart. Injected into the spinal canal the drug should be no more depressant or dangerous to the heart than a similar dose in another part of the body. A. M. Phelps reports a case of death from the local (not spinal) injection of thirty

minims of 2 per cent solution, and claims to have known two other deaths from the injection of a 10 per cent solution into the gums. Six tenths of one grain may then be assumed to be the smallest fatal dose. The amount of cocaine for safety, therefore, should be limited to three tenths or four tenths of a grain, which amount of an active drug will produce complete analgesia in parts below the diaphragm, or, according to Morton, as high as the face.

Fourth: The immediate danger of meningitis and myelitis from infection through the puncture under proper aseptic precautions should be rendered practically nil. The chief danger lies in the skin of the patient, which can not be rendered absolutely sterile. To avoid infection from this source a small incision is recommended to be made through the skin for the insertion of the needle. This I have found to be unnecessary. When we consider the frequent use of hypodermic medication, and the extreme rarity of resulting infection, it seems reasonable to conclude that thorough cleansing of the skin of the back as for any surgical operation will give a field devoid of danger. Carelessness in the technique may undoubtedly be productive of great harm, and no one should attempt spinal injection who is not familiar with practical asepsis. So far as I can learn, there have been up to this time no reports of infection through the puncture. The annoying and disagreeable symptoms that have been reported are by no means constant or certain. Rapid heart, nausea, vomiting, faintness, dizziness, pallor, sweating, cyanosis, and involuntary evacuations of the rectum have been noted during the analgesia. These symptoms appear with the nausea, and just prior to vomiting, and usually are not sufficient to annoy or cause alarm. Headache more or less persistent has occurred as an after-effect. Nausea appears in about 30 per cent of the eight hundred and three cases in which mention is made of the condition, and usually within fifteen minutes of the injection, but in a few instances it has occurred after the operation is concluded. It is usually slight, not persistent, and infrequently accompanied by vomiting. Headache appears to occur with about the same frequency. This can usually be relieved or prevented by the use of acetanilid, citrate of caffein, and bicarbonate of sodium. To counteract toxic symptoms, Marx recommends hydro-bromate of hyoscine just after the cocaine is administered, and nitro-glycerine with it or at the onset of nausea. Involuntary evacuations have occurred in only one of my cases, which I attribute to the fact that the rectum and bladder have been emptied prior to operation. In fact, these patients received the same preparation

as for general anesthesia. The possibility of psychic pain will interfere with the efficiency of the method in very nervous individuals. Conversation regarding conditions met during the operation will, of course, be properly prohibited. The ability to converse with the patient will not ordinarily prove of especial value, although Rodman says he was materially assisted by the patient in the manipulation of a leg he operated upon by this method.

After every general anesthesia, especially for the more serious operations, the appearance of the patient is certainly indicative that he has been through a serious ordeal; moreover, some time must elapse before he regains full control of his faculties. That the shock of the general anesthetic, combined with that of the operation, tends to reduce the resistance of the patient to later dangers, such as sepsis, suppression of urine, bronchitis, pneumonia, etc., I firmly believe. The shock after even major operations done under spinal analgesia is very slight. One who has seen the ghastly and helpless appearance following prolonged anesthesia, and the bright, cheerful expression of the patient who has had the cocaine injection, is impressed by the marked contrast between the two conditions. This method of analgesia can be used in many cases in which a general anesthetic is especially dangerous, such as heart disease, bronchitis, or Bright's disease, with or without dropsy. These conditions, even with our present knowledge, offer a field for the use of cocaine. Old persons will certainly withstand the shock of an operation better under local than general anesthesia, and the interference with glandular activity, so frequent a sequence of general anesthesia, is not present. There is less disturbance of the lungs or heart; less interference with secretions; less shock; patient is conscious, and can give immediate notice of any ill feeling; after abdominal operations food and drink can be administered early without fear of nausea and vomiting, as the nausea occurs soon after the injection is given, and disappears promptly. A major operation apparently becomes a minor affair when done under cocaine. My experience leads me to favor this over general anesthesia in operations about the rectum and anus. This very sensitive part requires the most profound general narcosis to prevent resistance upon divulsion of the sphincter. I have divulsed under spinal cocainization from twelve drops of a 2 per cent solution, and operated for hemorrhoids and for fistula, without any resistance or complaint of pain upon the part of the patient. In fact, rectal cases have given me a very favorable impression of this method. Future cases may cause me to change my opinion in this

regard, for I use the method tentatively and with great caution. The whole question will depend upon the amount of danger incident to the use of cocaine in this way.

Some objections offered to this method of obtaining analgesia are :

1. The idiosyncrasy which certain individuals have to the drug makes its action variable, and some make the claim that it can not be depended upon. This is to some extent true, but the percentage of failures to reach the canal and to obtain analgesia after making the injection is very small—thirty-seven in fifteen hundred and thirty-four. About one third of these were failures to obtain the fluid.

2. Many claim that the method is far more dangerous than chloroform or ether. At first mention of the trial of such measure the profession was naturally impressed by the great possibility of harm, but as case after case is reported, we find the danger to be far less than was anticipated. One peculiar feature is that those writers who have little or no experience with the method are the ones who make the greatest outcry about its danger. I have collected over fifteen hundred cases, the greater number performed in this country, without a death that can be directly attributed to the injection into the cord. The case occurring in the experience of Tuffier would never have been attributed to the anesthetic had the operation been performed under general anesthesia. It occurred twenty-four hours after the anesthetic, and the lesions shown in the heart and lungs were such that one need look no further for the cause of death. Murphy says (Journal American Medical Association, February 9, 1901): "A close analysis of the details shows there is ground for believing that the drug was in no way responsible for the fatality."

P. Reclus states that spinal cocainization now has a record of six deaths in Europe. Gorlav and Jonnesco, of Bucharest, have each reported a fatality. In the former case 1.5 cg. of cocaine was injected and a leg amputated. Two hours later the temperature rose to 38° and 40° C.; pulse 125, and death occurred in twenty hours. Juillard has reported a death the second day after an operation for hydrocele and inguinal hernia. The autopsy showed a ruptured aneurism of the sylvian artery. The vaso-constriction excited by the cocaine may have been a factor in the premature rupture of the aneurism. Even in Tuffier's case, in which a mitral lesion and acute edema of the lung have been assigned as a cause of death, Reclus queries whether the action of the cocaine may not have been a factor in the evolution of the edema.

Heumberg has also reported the death of a man of thirty years, fifteen days after an operation under spinal cocainization. The autopsy disclosed a hemorrhage into the cauda equina. In Dumont's case a febrile, tuberculous lad, in bad general condition, died two days after spinal cocainization, and no direct cause for the death could be discovered at the autopsy unless it was the cocaine. "This total of six deaths to less than two thousand applications of spinal cocainization is not an encouraging record," he remarked in the conclusion of his address to the Paris Academie de Medicine, March 19, 1901. (From Journal A. M. A., April 19, 1901.)

When we notice the first two cases, in only one is any statement made of the condition of the patient prior to death, and in that one (Gorlav) the cause of death is, to say the least, not clear. To place a rupture of a sylvian aneurism on the day after the operation to the credit of the cocaine is beyond reason, for the effects of the drug are very transitory, and the operation itself, with its excitement, would be more likely to hasten rupture than would the cocaine. Death in a case like that of Tuffier's under other circumstances would be considered explained by the changes present. The case of Dumont's, also, certainly should not be attributed to the cocaine two days after its use because no other cause could be determined by autopsy. Cases may die from exhaustion and anemia after operations as well as from sepsis. So that as a proven fact, of these cases only that of Heumberg should be accepted as due to the injection of cocaine. Folet reports in the Echo Medical of March 31st (Journal A. M. A., April 20, 1901) another death in progressive collapse five days after spinal cocainization. No analgesia was induced, and the operation was postponed for two days and performed under chloroform. The patient was a man of fifty, in satisfactory condition. Why should the cocaine be charged with a death five days later, and three days subsequent to the use of chloroform? Too many conditions can contribute to the causation of death for a case such as this to be accepted as a death from cocaine without further data.

M. Racoviceanu-Pitesci, of Bucharest, states that he heard of two deaths in Roumania (probably those of Gorlav and Jonnesco), but they were not among his cases, and no details are given, so we omit them for want of the facts. It appears to me unfair to place these deaths in my report, as the total number of cases among which they occurred is not given, and although I have made repeated efforts to obtain more complete European reports, I have so far failed. A full, close study of the

reported fatalities would be interesting. The American reports show no fatalities due to the injection into the spinal canal, and from the reports at hand it appears to be a quite safe means for the relief of operative pains.

The ages in which it has been used varies from two and a half (Bainbridge) to eighty-four (Weber). In children the fear of pain will prevent its frequent use. Old persons seem to stand the operation under it very well indeed. The scope of the operative analgesia is usually considered to be below the diaphragm, but Morton, of San Francisco, writes me of a case in which he removed a two-pound tumor from the face without pain. He claims that the rapid instillation increases the area of analgesia without an increase of depression. Marx, on the other hand, inclines to the view that rapidity of injection has no effect upon the extent of the analgesia.

The time length of analgesia varies, but usually lasts an hour or more. Dr. Goldan performed several different operations upon a patient which required one hour and fifty-five minutes, using one injection, and the patient only noticed pain at the end of this time. Marx, Bainbridge, and others have not hesitated to use more than one injection if needed to carry out the indicated procedures. Some minutes should be allowed to elapse between the instillations for fear of an overdose. The technique of the injection has been so frequently published that I shall only briefly state the steps. The cocaine must be sterile. This can be accomplished by the fractional method (80° to 30° repeated several times), or it can be shaken in ether and then dissolved in sterile (boiled) water. (Bainbridge). A number of operators depend upon the sealed sterilized tubes with perfect success. Tuffier, in an article in *La Presse Medicale*, No. 15, February 20, 1901, describes three methods for sterilization. The first is heating to 120° C. in a sealed vessel in oil. This method, he claims, does not decompose the drug. It appears that by heating in this way under pressure the water of crystallization is retained and decomposition does not occur. The second is the method of fractional sterilization mentioned above, and the third is filtration through a porcelain (Chamberlain) filter, the first portion which passes through being thrown away. He shows a small apparatus devised for him by Roux. Every vessel and all water used in the preparation must be sterilized by heat. No bicarbonate of sodium should be used in sterilization, as that decomposes the cocaine. (Bier claims to have developed a perfectly safe technique which has not yet been published.)

The solution should be fresh, yet it seems to keep indefinitely in the sealed tubes. A two-per-cent solution seems to be uniformly the most satisfactory, and the dosage should be limited to 25 minims as the maximum, from 15 to 20 being best. The dosage should be reduced for children according to age. A small amount of morphia may be incorporated with the cocaine (Matas). A platinum needle of small caliber, about three inches long, and with a short bevel to prevent leaking at the point of puncture, is preferable. A similar steel needle may be used if proper care is taken to prevent rusting. Sterilize by boiling. The syringe used by Marx is a solid barreled metal one. Others use a glass syringe without any metal attachment, the piston being covered with asbestos or rubber. Either of these can be boiled. The greatest care should be given to the sterilization of the patient's back. Shave when necessary, then scrub thoroughly with soap and water, then with alcohol, and finally wash with a solution of bichloride of mercury 1–500. The guide to the puncture is the fourth lumbar spine, which lies on a level with top of the iliac crests. The puncture is usually made in the space between third and fourth or fourth and fifth lumbar spines while the patient bends the spine strongly forward, scorching position (Marx).

I have never found it necessary to use the ethyl chloride spray to anesthetize the point of puncture, having found that simply informing the patient that he will feel the needle and must not move is sufficient. The point should enter a very little to the right and below the spine selected, and should be directed forward and very slightly inward and upward. If a bone is impinged upon, the needle should be partly withdrawn and pushed forward in a new direction. The ligaments of the vertebræ offer a slight obstruction to the needle, so that a sense of diminished resistance is felt when the canal is reached, and almost instantly the clear fluid will flow drop by drop. If it does not appear, have the patient cough; if no result, suction on the needle with the syringe will usually start it. When the fluid is obtained and only then is it wise to make the injection. The amount of fluid allowed to escape should approximate the quantity to be injected. The fluid is instilled slowly, although some operators thrust it in rapidly to get a greater area of analgesia. The point of puncture is to be protected by collodion on sterile cotton or by a gauze pad. The patient remains sitting for a minute or so, then assumes the recumbent position. If his condition is such that recumbency is enforced, the injection is made with the patient

on his side, supported by a pillow. After the operation, rest in recumbency should be enforced. The patient should have the same preparation prior to operation as is usual for general anesthesia. A number of substitutes have been proposed for cocaine, such as antipyrine, eucaine, and tropacocaine. None of these seem to act as well as cocaine. The most favorable report comes from Dr. Karl Schwartz, of Agram, who has used tropacocaine in sixteen cases. Dr. Wiley Meyer, in Medical News of April 13, 1901, after an experience of four cases in which this method was used, says that the following points of importance in comparison to cocaine were found:

1. That tropacocaine is less than half as toxic as cocaine.
2. The depressing action both on cardiac motor ganglia and cardiac muscle, particularly the latter, is much greater with cocaine.
3. Recovery from its effects is much more rapid.
4. The solution is by far more stable than cocaine hydrochlorate.

M. Tuffier, *Presse Medicale*, April 24th (letter to Journal A. M. A., May 18, 1901), states that he has tried tropacocaine as proposed by Schwartz and found it too weak. Fritz Engelman, in writing of eucaine, says that he had the unpleasant effects without the anesthesia of cocaine, and therefore considers that we will not find a substitute in eucaine. Others have arrived at similar conclusions, although Keen's case shows that it may be analgesic.

My personal experience embraces twenty-seven cases, in one of which, a woman of three hundred pounds, I failed to obtain the cerebro-spinal fluid, although the diminished resistance usually noticed was felt. In another the patient insisted upon being put to sleep, so required one and a half drams of chloroform to quiet her. She said afterward that she did not suffer any pain, but wanted chloroform because she was afraid she might be hurt. The others gave the usual phenomena noted, two having nervous rigors. One of these at a second operation by the same method had no nervous phenomena at all. Several went through the operation without pain or discomfort of any kind, notably a man of sixty-seven, amputation at the knee for diabetic gangrene. This patient died on the fourteenth day of sepsis, the stump being infected. His temperature was 102° at time of operation. An examination of his cord, cauda equina, at point of puncture showed no pathological change either macroscopically or microscopically, showing that there is no bad affect upon the cord.

The conclusions at which I have arrived from a close study of the situation are that cocaine analgesia will not likely prove satisfactory in

operations above the level of the diaphragm; that it will perhaps not be much used in abdominal cases which are not clear and are likely to prove tedious or difficult; that its special field will be found in operations upon the lower extremity, including amputations and resections, and those of perineum, bladder, and rectum; also that it is at least useful in old persons and those who are suffering from diseases of the heart, lungs, or kidneys, from cirrhosis of the liver, and from abdominal dropsy; that it can be successfully employed where a patient fears general anesthesia, and we certainly throw aside a valuable addition to our armamentarium if we neglect to use this method in the proper cases.

CASE 1. October 18, 1900. Will S. Hypospadias. Fourteen minims two-per-cent solution of cocaine were injected. Pulse 120 throughout. Complete anesthesia of field in seven minutes. Operation completed in thirty-two minutes. Slight nausea and headache same day. Headache and pains along the spine following day, and on third day severe headache at base of brain and along spine. Dizziness, no infection at point of puncture, and no elevation of temperature.

CASE 2. Louis W. Herniotomy. Pulse before operation 78. Seven minutes after the injection of ten minims two-per-cent solution of cocaine pulse reached 130. After ten minutes fell to 66. Patient complained of pain during the operation, but afterward admitted that the pain was very slight. A fall of temperature occurred after the operation, relieved by strychnia, whisky, and heat to the surface.

CASE 3. E. Van A., white, about thirty years old. Appendicitis. Fifteen minims two-per-cent solution of cocaine injected. Pulse 80. Operation completed in forty-four minutes from the time of incision. Patient complained of some pain in the upper part of the wound, and also in manipulation of the intestines during the latter part of the operation. No nausea or headache followed operation.

CASE 4. R. S., white. Double vasectomy. Fourteen minims two-per-cent solution of cocaine injected. Pulse was 74, reaching 84 during the operation. It became weak and irregular as traction was made upon the cord. Patient was nauseated at the time. Operation lasted thirty minutes from the time of incision. Patient left table with pulse 68.

CASE 5. B., male, colored. Extensive fistula in ano. Pulse 85. Twenty-three minims two-per-cent solution of cocaine injected. Operation completed in fifteen minutes. Patient slightly nauseated, with a profuse sweat. No pain or other disturbances.

CASE 6. R. G., male, white. Hemorrhoids; clamp and cautery.

Twenty-two minims two per-cent solution of cocaine injected. Pulse 90. Operation lasted twelve minutes with absolute anesthesia and without any bad symptoms.

CASE 7. A. J., white, age twenty. Varicocele. Pulse 126. probably from fright. Twelve minims two-per-cent solution of cocaine injected. Operation completed in thirty minutes without any pain or other bad symptoms.

CASE 8. J. C., white, age twenty-three. Necrosis of tibia. One-eighth gr. of morphia before beginning. Pulse 82. Eighteen minims two-per-cent solution of cocaine injected. Patient was nauseated and vomited nine minutes after the injection. The operation was completed in twenty minutes. Patient left table with pulse 66.

CASE 9. G. M., age twenty-nine. Bubotomy. Twelve minims two-per-cent solution of cocaine injected. Operation completed in fifteen minutes without pain and with very slight nausea.

CASE 10. January 5, 1900. Chester H., white, age nine. Abscess from Pott's disease of the spine. Seven minims two-per-cent solution of cocaine injected slowly at 3:19 P. M. Injection made at tenth dorsal space in order to reach the cord above the infected area and also above the boss. Pulse at time of injection was 140. At 3:27 patient vomited twice. The abscess was opened and scraped five minutes after the injection. Patient complained of feeling pain, but did not at any time flinch, nor was the crying marked. Afterward admitted that the needle going in was all that hurt. Operation finished at 3:30. Pulse 120.

CASE 11. Miss B., white, age twenty-two. Operation curettment for retained placenta. Patient blindfolded. Puncture between fourth and fifth vertebræ at 10:30 A. M., pulse 78; 10:35, pulse 120. Operation begun at 10:42. Pulse remained 120 throughout the operation, which was completed at 10:52 without any pain. Patient vomited at 10:55. Patient on leaving the table passed the remains of an enema from the bowels with some fluid feces. Did not appear to be aware of the passage. No other bad symptoms.

CASE 12. Clara A., white, age twenty-four. Removal of one tube and ovary. Pulse 84. Fifteen minims two-per-cent solution of cocaine injected. Loss of sensation of hip in three minutes. Nine minutes after the injection patient made efforts at vomiting. The operation was commenced seven minutes after the injection and completed in thirty-one minutes with absolutely no pain and without muscular resistance. Lips were rosy throughout. The pulse reached 108 at one time during the

operation. As soon as the patient was told that the operation was finished pulse fell to normal. There were no untoward symptoms.

CASE 13. Nellie F., white, age twenty-four. Abdominal section. Urine 1026; albumen abundant; no sugar. Granular, hyaline, epithelial casts. 3:20 P. M., pulse 92. Twenty minims two-per-cent solution of cocaine injected. Patient insisted on being put to sleep. Was very nervous. 3:21, pulse 80. 3:27, incision made. Patient complained greatly of pain. 3:42 she vomited, and pulse reached 120. Nausea ceased in two minutes. A whiff of chloroform was given for its mental effect, and the patient immediately ceased complaining of pain. The operation lasted one hour and fifteen minutes. One and a half drachms of chloroform were used. Patient left table pulse 72. Afterward she said that she did not suffer pain, but feared that she would be hurt.

CASE 14. Lizzie K., white, age twenty-nine. Operation for internal fistula and hemorrhoids. Twelve minims two-per-cent solution of cocaine injected between the third and fourth vertebræ. Pulse 120. The field became anesthetic, and operation commenced five minutes after the injection. Pulse reached 128 at one time. Operation completed in twenty-five minutes without pain. Patient made one effort at vomiting after returning to bed. A slight numbness in the right leg was complained of for several days, not sufficient, however, to interfere with locomotion.

CASE 15. Abner S., white, age sixty-seven. Amputation for moist diabetic gangrene of the foot. Temperature 102.5°. Pulse 120. Eighteen minims two-per-cent solution of cocaine injected. Felt numbness in two minutes after injection. In six minutes analgesia extended to the epigastrium. Eleven minutes after injection operation commenced. Pulse at one time reached 134, being apparently excited by remarks of the operator regarding hemorrhage. Patient asked for water, which was given him. Analgesia complete throughout without any bad symptoms. Parotid abscess developed, and patient died of general sepsis sixteen days later. Examination of the cauda equina at the point of puncture showed no evidence of injury.

CASE 16. Geo. W., white, age thirty. Operation for hemorrhoids with clamp and cautery. Fifteen minims two-per-cent solution of cocaine injected. Operation completed in fifteen minutes. Patient left table with pulse 100. No vomiting, no pain, nausea having lasted only a moment.

CASE 17. William S., white, age twenty-four. Hemorrhoids, with clamp and cautery. This man had been submitted to spinal analgesia

three months previously. Fifteen minims two-per-cent solution of cocaine injected. Pulse 120. Operation was completed in ten minutes, the patient having no pain whatever.

CASE 18. John F., white, age twenty-one. Curetting ulcers on leg. Fifteen minims two-per-cent solution of cocaine injected. Pulse 90. Operation completed in fourteen minutes. Patient left table with pulse normal. No pain, no unpleasant symptoms. Highest rate of pulse 94.

CASE 19. Will C., colored, age twenty-nine. Appendicitis in the interim. Twenty minims two-per-cent solution of cocaine injected. Pulse 72. In six minutes patient felt numbness in the foot, which was soon followed by sense of heat in the leg. Fifteen minutes after the injection patient was very slightly nauseated. Asked for water, and drank two ounces. Complained of feeling hot. Was perspiring profusely, but surface was warm. Operation completed in fifty minutes. Pulse 66, strong and full. Patient complained of numbness in the hand. No other bad symptoms were noticed.

CASE 20. J. S., white, age thirty-six. Varicocele. Twenty minims two-per-cent solution of cocaine injected. Pulse 84. Patient vomited fifteen minutes after the puncture. Vomiting ceased five minutes later. Operation completed in twenty-two minutes. No pain.

CASE 21. G. W., white, age thirty. Excision hemorrhoidal tags. Fifteen minims two-per-cent solution of cocaine injected. Pulse 150. Operation was completed in twelve minutes without pain.

CASE 22. John A., white, age twenty-eight. Excision of knee. Temperature 100° F. Pulse 96 before going on the table. While scrubbing the back, pulse ran up to 120. Seventeen minims two-per-cent solution of cocaine injected. At the time of incision the pulse reached 132 and lost some in strength. Operation completed in one hour without pain or other disagreeable symptoms.

CASE 23. Will G., colored, age forty-two. Hemorrhoids; clamp and cautery. Puncture was made at third effort. Fourteen minims two-per-cent solution injected. Pulse 96. Operation was completed in twenty minutes, patient having complained of slight pain on the right side of the anus. Vomited after being returned to bed. No other symptoms.

CASE 24. Mary W., white, age thirty-two. Resection of nerve. Patient of extremely nervous temperament. Very nervous heart. Pulse 126, not strong. Twelve minims two-per-cent solution of cocaine injected. Operation was completed in fifteen minutes without pain. Patient was nauseated for about two minutes. Her hands were cramped,

and pulse at wrist was obstructed by the contraction. She has often experienced similar nervous phenomena at the menstrual periods, so I believe the cramping to be hysterical. A drink of whisky and one sixth of a grain of morphia relieved her. Slight headache at night.

CASE 25. Mrs. L. P., colored, age forty-five. Failed to find the fluid at third effort, so did not inject.

CASE 26. Robert B., colored, age twenty-nine. Appendicitis. Fifteen minims two-per-cent solution of cocaine injected. Pulse 120; ran up to 126 during the operation, which was completed in forty-two minutes. No symptoms during the operation, but a very slight headache during the night.

CASE 27. Mr. D., white, age fifty-three. Hemorrhoids, with clamp and cautery. Fifteen minims two-per-cent solution of cocaine injected. Operation begun at 12:19 P. M. Pulse ranged from 74 to 88. Operation completed at 12:39 without pain, but the patient vomited after leaving the table.

	Number of Cases.	Successful.	Partial success.	Failures.	Headache.	Nausea.	Vomiting.	Deaths from method.	Deaths from other causes	
Anderson, C. H.	6	6	...	...	...	...	...	...	1	Trans. Miss. Vall'y Med. Asso., Oct. 9-11, 1900.
Bainbridge, W. S.	57	55	Eucaine 1	Over Stl zd 1	*	Usual for a moment	(a) 1/8	...	...	Medical Record, Dec. 15, 1900; Med. News, May 4, 1900, and letter.
Bogart, J. B.	25	18	...	7	..	..	...	...	...	N. Y. Academy Med.
Boldt, H. J.	1	...	...	1	...	...	...	..	..	New York Med. Journal Nov. 3, 1900.
Brewer { 4 Cocaine, 2 Eucaine }	6	4	... 1	2	...	...	...	...	...	Mentioned by Dr. Weir before Med. Asso. of Greater New York, Dec. 10, 1900.
Bullitt, J. B., and Cartledge, A. M.	20	13	3	(b) 4	3	...	..	...	1	Reported herewith by Dr. Bullitt.
Coe, K. C.	1	1	...	...	...	...	...	..	...	N. Y. Academy Med., Oct. 25, 1900.
Dudley, A. Palmer	6	6	...	...	...	...	...	...	...	Idem.
Dominische	3	3	...	...	...	...	...	...	..	Il Policlinico.
Engelman, F.	1 Eucaine		...	1	...	...	...	...	...	. . . . .
Fowler, G. Ryerson	106	98	8	...	out 16	of 25 11	cases 6	..	...	N. Y. Med. Record, Dec. 22, 1900, and personal letter.
Gibney, H. V.	3	2	...	1	2	2	2	...	...	Personal letter.
Goffe, J. Riddle	2	2	...	...	...	...	...	...	...	Med. News, Oct. 13, 1900.
Goldan, S. O.	34	28	2	4	...	...	...	...	...	N. Y. Rec., Dec. 22, 1900, and personal letter.
Grandin, E. H.	3	...	...	3	...	...	...	..	...	N. Y. Med. Record, Dec. 22, 1900.
Haggard, W. D.	2	1	1	...	...	...	...	...	...	Southern Practitioner, April, 1901.
Hawley and Taussig	21	21	...	..	3	12 / 3 / 15	of 14 / of 7 / 15	labors / gynecol	...	Medical Record, Jan. 19, 1900.
Kammerer, F.	40	40	...	...	...	...	...	...	...	Medical Record, Dec. 22, 1900.
Keen, W. W.	1	1	...	...	...	...	...	..	Urinary sepsis 18 days after operation. 1	Phila. Med. Jour., Nov. 3, 1900.
Keiller, Wm.	3	3	...	...	...	...	...	...	...	Texas Med. News.
Lyman, J. V. R.	51	51	...	..	33 per ct	90 per ct	75 per ct	.	...	Personal letter.
LaPlace, E.	2	1	...	1 Fluid not obtained. No injection.						Phila. Medical Journal, Nov. 3, 1900.
Lee, E. W.	7	7	...	...	1	1	...	..	...	Phila. Medical Journal, Nov. 3. 1900.
McDonald, W. G.	1	..	1	...	1	1	...	...	...	Albany Medical Annals, January, 1901.
Massey, J. E.	1	1	...	...	...	...	...	...	...	New York Med. Journal, Oct. 20, 1900.
Marx, S.	175	170	1	4	In 23	69 cases 1	4	...	...	Personal letter, not including 4 cases of eucaine which were failures, partial or complete.
MacMonagle	2	2	...	...	...	...	...	...	...	Reported by Dr. Barbour, Sou. Surg. and Gynecological Society, Atlanta, Nov. 3, 1900.
Mallet, E. P.	2	1	1	...	...	...	...	...	...	Sou. Surg. and Gyneco. Society, Nov. 3, 1900.
Matas, R.	32	28	3	Eucaine 1	..	...	...	...	...	Phila. Med. Jour., Nov. 3, 1901, and personal letter.
Morton, A. W.	265	265	...	...	37	66	56	...	7	Pacific Medical Journal, Nov. and Dec., 1900, and personal letter.
Murphy, J. B.	62	59	1	2	...	...	...	...	...	Journal A. M. A., Feb. 9, 1901, and personal letter.
Neff, M.	2	2	...	...	...	...	...	...	...	Reported by Dr. Murphy, Journal A. M. A., Feb. 9, 1901.
Podesta, Buenos Ayres	21	21	...	...	...	...	...	...	...	Semaine Medicale, Aug. 23, 1900.

* Majority, slight as a rule.
(a) Initial emesis in one third of cases, never severe or long continued; rare after operation.
(b) In two cases failed to find the fluid.
Two cases failed to obtain analgesia because of old cocaine.

	Number of Cases.	Successful.	Partial success.	Failures.	Headache.	Nausea.	Vomiting.	Deaths from method.	Deaths from other causes	
Racoviceanu-Pitesci	125	121	. . .	4	. . .	. . .	. . .	. . .	. . .	International Congress Paris, 1900.
Rodman, W. L.	2	2	. . .	. . .	. . .	. . .	. . .	. . .	. . .	Phila. Medical Journal, Nov. 3, 1901.
Severeanu	70	70	. . .	. . .	. . .	. . .	. . .	. . .	. . .	International Congress Paris, 1900.
Segren and Kendirdjy	55	55	. . .	. . .	31	. . .	24	. . .	. . .	LaPresse Medicale, Oct. 27, 1900. Am. Jour. Med. Sciences, February, 1900.
Sharp, H. C., Jeffersonville, Ind.	33	32	1 Old	coca	ine	70 per ct	7 per ct	. .	. . .	Personal letter.
Sherrill, J. G.	27	25	1	1	3	10	6	. . .	. . .	Reported herewith.
Tuffier, T.	252	252	. . .	. .	40 per ct	20 per ct	. .	. . .	5	Semaine Medicale, Paris, Dec. 12, 1900.
Weber, C.	3	3	. . .	. . .	. . .	. . .	. . .	. . .	. . .	Jour. A. M. A. (Murphy), Feb. 9, 1900.
Weir, Robt. 2 Cocaine 1 Eucaine	3	2	1	. . .	. .	. . .	. . .	. . .	. . .	N. Y. Med. Record, Dec. 22, 1900.

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DISCUSSION.

Dr. HENRY C. SHARP, of Indiana (by invitation): My experience in the use of the subarachnoid injection of cocaine for the production of anesthesia has been limited to thirty-three cases, including operations on the abdomen, amputations, curettment of the uterus, and removal of the tubes. As yet I have had no deaths, either from the result of the anesthetic or from the post-operative shock. In a case of curettment of the tibia I operated three times, using the subarachnoid injection each time. The patient has had no symptoms whatever of paralysis or any of the suggested bad effects that may arise from this method of analgesia. I wish to emphasize one point, and that is that the nausea and vomiting, which we have not seen as yet, usually comes on from ten to twenty minutes after the injection of the cocaine, and lasts about one to three minutes. There is very little retching, and the skin becomes moist and cool.

One other point which is of great advantage is that your patient is anesthetized, operated upon, and in the ward in the same space of time that would be required to anesthetize the patient with a general anesthetic. This is quite a feature for the man who operates three or four times a day, and who would lose too much time while the anesthetic is being used. All the patients I have operated on are still under my supervision. So far there have been no post-operative effects as the result of this procedure, and if no more complications arise in the future than in the past, I see no reason why this method should not be used in well-selected cases.

Dr. WALKER B. GOSSETT, Louisville: The first time the subarachnoid injection of cocaine was used in this city was in the Louisville Medical College by Dr. A. M. Cartledge, and it was my good fortune to see it used. I thought at that time that if the occasion ever occurred I would use it in a case of labor and see what effect it would have. I subsequently saw a case of labor in which this method was used, and it was the first time in this city and in that state. The case was that of N. G., colored, aged twenty. The subarachnoid injection of cocaine was made for me by Dr. James B. Bullitt at 8:56 P. M., October 27, 1900. At 9 o'clock a tingling sensation was felt in the right foot, and the sensibility of the labor pains were lessened. At 9:02, six minutes after the injection, there was no suffering whatever from the uterine contractions. At 9:03 a numb feeling was felt in the left leg, which extended into the right hip a half minute later, and under the ribs 9:05. At 9:08 the pulse was 98. Before the injection was made the pulse was 96. During the entire time the pulse never got over 98. There was a good uterine contraction at 9:08. Half a minute later the patient was slightly nauseated, and vomited at 9:09. At 9:11½ there was another good uterine contraction, and at 9:16 the membranes were ruptured artificially,

and the head descended nicely with the contraction. At 9:18 the patient again became slightly nauseated, but this feeling passed away quickly. Absolutely no pain was felt upon pricking the patient's legs and abdomen to the level of the axilla with a pin. There were good strong uterine contractions at 9:22, 9:37, 9:39, 9:43, 9:46, 9:49, and 9:51. At 9:58 the patient complained of a slight pain in the right side in the ovarian region. This was the first sensation of pain she experienced, making one hour and two minutes of complete anesthesia from the time the injection of cocaine was given, and fifty-six minutes from the time she felt no more pain. At 10:04 the patient complained of pain in the lower abdomen. At 10:09 there was a good uterine contraction, and she felt more pain. At 10:20 she suffered a great deal of pain, with a strong, firm contraction. Pulse at 10:30 was 96. The uterine contractions increased in sensibility. At 10:25 there was a great deal of suffering, and the occiput was beginning to pass over the perineum. At 11:55 the head was delivered, the body following immediately afterward. She had good uterine contractions after explusion of the placenta, which occurred five minutes after the delivery of the child. The child was a girl, weighing eight pounds.

In this case the second stage ended within the normal time limit, lasting from 9:16 to 11:55, two hours and thirty-nine minutes. If the injection in this case had been made after the internal rotation of the occiput, about the beginning of the perineal stage, and if the woman had been a multipara, I think the child would have been delivered while the patient was under the influence of the cocaine and without any suffering. I was impressed with the fact that the proper time for making the injection is at the beginning of the perineal stage.

There were no bad after-effects from the use of the cocaine. The patient had no pain, although there were good firm contractions of the uterus. I had to wake her several times, as she said she was so tired that she went to sleep. As there have been several cases of death reported as caused by the simple lumbar puncture for diagnostic purposes, and having had no fatalities from the use of chloroform in labor, I feel that it is far safer than the subarachnoid injection of cocaine.

Dr. HAWLEY, Louisville: I had the pleasure of witnessing the operation described by Dr. Sherrill. I was the timekeeper. I took that place at the time the injection was made, when the pulse was 74. Within a minute and a half it dropped to 70; in eight minutes it went up to 88, where it remained throughout the entire operation. From the time of the injection of the cocaine until the completion of the operation, a clamp and cautery operation for hemorrhoids, nineteen minutes elapsed. The operation was begun about seven minutes after the injection. As the smoke was going up into the air the patient was asked whether it hurt, and he promptly said it did not, and that he was hungry. At the end of the operation the patient was taken off the table. During the operation he conversed with me.

If we can convince ourselves that this operation is free from danger, it

is undoubtedly one of the great boons for surgeons, for I never witnessed an operation in my life that looked so pleasant and free from death as that operation did. In fact, the patient would look up at me and smile while he was being operated on. There was no sign of shock.

Dr. A. M. CARTLEDGE, Louisville: I was greatly interested in the paper, which is a complete resume of the subject, and really leaves nothing for me to say. I think of the many papers written on this subject, this paper is the best. It is the most pertinent and simple, because the entire subject has been taken up in a plain and practical way, giving the good and the bad sides of this form of anesthesia. We used this method here very early, and my experience simply bears out what was said by the essayist. I was struck with one remark made by the essayist; he said that we use spinal anesthesia and like it, and that the men who condemn it the most have usually not used it at all. Strange to say, that has been my observation. Men have condemned it without ever having used it or ever having seen it used. It is a dangerous thing to stick a needle into a man's spinal cord, but not nearly so dangerous as the ordinary anesthesia with chloroform or ether.

One of the great wrongs is that men associate the disastrous results due to puncture of the spinal canal, the nervous cases for diagnostic purposes, with the puncture of the normal canal for the purpose of producing anesthesia. If you will take men not trained in asepsis and let them inject cocaine into the spinal canal, it certainly is a very dangerous procedure. With all deference to the neurologist, I never saw one who was a surgeon, and I would let none of them puncture my spine. A surgeon can do it, however. There lies the trouble. We must prepare the patient, ourselves, and the instruments just as we would for an aseptic operation, and then the dangers are practically nil. I have not used it in every case, but I am convinced that it is always indicated in these old nephritic cases and heart cases in which you are afraid to give chloroform. You know the fatality of chloroform and ether; they do not die on the table, but a few days afterward from defective elimination. This never occurs with spinal anesthesia, and there is where the great value of spinal anesthesia comes in.

I think it is incumbent upon us to familiarize ourselves with the method outlined by the essayist, and let every physician make at least an effort to use this method in properly selected cases. Spinal anesthesia has come to stay, although I am not prepared to say that it will take the place of the general anesthetic in every case.

Dr. JAMES B. BULLITT, Louisville: I find myself in a rather peculiar position. During the month of April Dr. Cartledge and myself used this method in twenty cases, the case delivered by Dr. Gossett being one of them. Among these there were three failures. In two of the cases it was found impossible to get the needle into the spinal cord so as to have a return flow of the subarachnoid fluid, and as the patient complained of much pain the effort was desisted in after four or five punctures had been made.

Chloroform was then given. In the third case the injection was given successfully, but no anesthesia resulted. The cocaine which was used was about two months old, to which fact I attributed the failure. It is always safer and better to make up the cocaine solution for each injection. It can be done very simply, and it will be found to be the more satisfactory way than to depend on any druggist or manufacturer to furnish this material in closed packages.

I listened to the doctor's paper with the greatest and keenest pleasure, and I think it is the best and fullest paper on this subject. It is a matter of great satisfaction to me to hear him record 1,500 cases without a single death which could be attributed to the cocaine. This does not mean that the method is as safe as chloroform, but we must always consider that in chloroform or ether narcosis the danger is estimated as immediate. We can not make any count of the after-effect of these drugs, but in the opinion of gentlemen who have had experience with them deaths do results some days after the operation as the result of their administration. I believe that this method of anesthesia has been used long enough for us to say that cocaine has been demonstrated to be safer in a certain class of cases than chloroform or ether, especially in those cases in which these drugs would be contra-indicated. Dr. Cartledge has already referred to these cases, but I will refer to two others, one a woman in the city hospital who was operated on for stricture of the rectum. An artificial anus was made. After three years the stricture had disappeared and the artificial anus had become strictured by scar formation, giving the woman as much trouble as she had originally from the stricture of the rectum. She had a valvular lesion of the heart, and also a chronic interstitial nephritis, and was therefore not a good subject for general anesthesia. Under cocaine anesthesia the bowel was dissected away from the wall, and then an anastomosis was made without any difficulty, the patient complaining of no pain except when traction was made on the intestine, when she had the sensation, as she explained it, "as though her insides were being pulled out." This patient felt only the pains of traction and pressure. The second case had a perinephritic abscess, one kidney being entirely destroyed, and with the probability of involvement of the other kidney. Under cocaine anesthesia the tumor was removed without any difficulty or pain to the patient.

Patients who have had chloroform anesthesia first and then cocaine anesthesia, invariably say that they prefer the latter, whereas patients who use the cocaine first and then the chloroform, prefer the chloroform.

Dr. ARTHUR T. MCCORMACK, Bowling Green: I believe that this Society ought to extend a vote of thanks to Dr. Sherrill for his most excellent paper, which I think the best and most painstaking paper that was ever presented to this Society. He has carefully reviewed all the literature on this extremely interesting topic, and has presented it to us perfectly impartially, giving the arguments for and against, so that any one can form a definite opinion as to its value. I believe that we ought to encourage the pre-

sentation of such papers, as they are not only a credit to the writer but the Society as well.

Dr. LOUIS FRANK, Louisville: I am heartily in accord with every thing that has been said on this subject. I, too, have had a little experience with spinal anesthesia, and all my cases with the exception of one are embodied in Dr. Sherrill's report. Drs. Cartledge and Bullitt have mentioned all the advantages and disadvantages of this method of injecting cocaine into the spinal canal. I fully agree with them in regard to the objections which have been raised to this method, and also that they are only made by gentlemen who have never used the method nor seen it used. I was in the same position myself until I saw a case operated on by Dr. Sherrill. My experience with it since that time has been so gratifying that I unhesitatingly recommend its use in selected cases. Patients felt absolutely no pain except the sense of contact, so that the fear of an operation is entirely eliminated. In one patient on whom I operated there was a partial failure, in so far that she cried out. She told me, however, that it was not from pain, but only from the fear of being hurt during the course of the operation. The case was mentioned by Dr. Sherrill in his paper.

Dr. Sherrill's paper is an excellent one, as it is an original paper and an original compilation. In the hands of careful surgeons, men who know how to clean their hands and their patients, there is not any more danger, if as much, as from the use of either chloroform or ether. I am convinced that no one who has seen a patient during an operation performed under spinal anesthesia, seeing the patient's cheerful countenance and noting the evenness which prevails during the operation, will say that this method is not preferable to chloroform. The method must be tried, and I would suggest that every one present make some effort to see the method used. Once used it will never be discarded, as it possesses so many advantages which have already been enumerated by the essayist over general anesthesia.

Dr. SHERRILL (closing the discussion): I wish to thank the members for their courtesy. It certainly is peculiar that these patients lose the pain-sense entirely and yet are able to appreciate contact and sometimes heat. They feel the pressure on the surface of the body, but do not feel the pain. When you make an incision the patient does not feel it, although he feels that something has come in contact with him. Why this is I do not know. The experiments of Tuffier and Talion have shown that the cocaine has a local action on the nerve-trunks as they leave the spinal canal, and that the action is centered almost entirely on the posterior roots, not affecting the anterior roots to any degree. There are some cases where patients complain of interference with locomotion for some days, but as a rule this does not occur. Neither are the tissues affected by the cocaine. The injection of other substances does not produce a like effect. It was claimed by some one that a normal salt solution would produce the anesthetic action, but on experimenting it was found that this was not true. The peculiar action obtained from cocaine is entirely due to the cocaine itself.

STRICTURE OF THE MALE URETHRA: A RESUME OF THE PRESENT METHODS OF TREATMENT.

HENRY H. KOEHLER, M. D.
LOUISVILLE.

The extent of the field of stricture operations will not permit me in an article like this to go into any details of the operations themselves; I purpose merely to survey the recent advances and set forth the predilections and dislikes for certain operative methods that obtain among representative surgeons to-day.

Finger defines stricture as follows: "A stricture is the result of a chronic cirrhotic periurethritis and cavernitis complicating a chronic urethritis." This brings to mind the salient features of many strictures, the condition being not merely that of a constricting band or cicatrix, but in many instances essentially a subacute inflammatory process.

I know of no better division of strictures than to divide them into recent and old, or inflammatory and fibrous or inodular. Stricture due to traumatism is to be classed alone, the result of healing processes here presenting certain peculiar features, complete obliteration, for example. The stricture that I have particular reference to is the gonorrheal stricture.

It must be born in mind that virtually a recent stricture consists of a bulging mass of inflamed tissue presenting the usual picture of a round-cell infiltration. A very important thing to remember, further, is that within this tissue we have yet lingering the gonococcus, its activity subdued and its propagating power lessened. Such an infiltrated tissue will in time merge into one that might be called cicatricial. Fibrous material is deposited, the stricture grows tighter, the walls of the urethra become hard, inelastic, and the type of the old or inodular stricture is before us. Practically, then, as viewed to-day, a recent stricture and chronic gonorrhea are the same, and the treatment conducted on similar lines. Endoscopically we find at the seat of the trouble clogged glands of Littre, engorgement of the lacunæ of Morgagni, epithelial thickenings, infiltrated submucous tissue or superficial epithelial losses. The early infiltrations are yet of a kind that permit of their dispersion by pressure, and I think there is an unanimity of opinion that dilatation, either with ordinary steel

sounds or with especially constructed dilators, such as Oberlaender and Kollmann have devised, is the ideal treatment. However, it is a question whether such conditions merit the term stricture; they had better be looked upon as inflammatory indurations in which usually the gonococcus is to be found, and where the elimination of this organism is as much to be desired as the restoration of the lumen of the canal, both of which can be accomplished by the judicious application of pressure.

Let us consider the effect of dilatation in cases where it is applicable: First, the distension itself in obliterating a contraction behind which exists, of necessity, more or less irritation, gives relief to such symptoms as bleeding and reflex disturbances of the vesical neck. Second, it seems positively proven that distension carried to the point where a muco-purulent discharge is set up, as often happens, will forcible invade deep-seated nuclei of gonococci and cause their mechanical dispersion and elimination. It may be asked, Are the extreme dilatations as now practiced, and coming more and more into vogue, good surgery? Is it not too rough a method to gain the point aimed at? The success clinically, in the hands of able men, forces us to but one conclusion: The method of extensive dilatation has no evil consequences, and if we wish to clear a canal of its latent foci of gonococci, it is the only one we have at our disposal. Wossidlo lays stress on the fact that an existing discharge containing gonococci is no contra-indication to this treatment, but that it becomes the treatment of choice. Much harm is sometimes done, though, by dilating too frequently. Keyes explains in his work the necessity of not dilating at too short intervals. Some time must elapse to allow the irritative congestion produced by the instrument to subside before it is reintroduced; from five to nine days is a safe time for the steel sound. In using the branched dilators, much longer time must be allowed to pass between sittings.

Dilatation is a procedure applicable to all regions of the urethra, and is usually practiced by the use of the steel sound, either straight or curved, depending upon the seat of the lesion. Bearing in mind, though, the extensive dilatability of the bulbous portion of the urethra, it becomes obvious that the full benefit of pressure can not be obtained here with a sound that passes comfortably the meatus and middle of the penile portion. The bulbous portion can be dilated up to 40 F., whereas a meatus of 30 is quite large, and the narrowest part of the penile portion averages about 30 F. also. To overcome this difficulty which the ordinary steel sound does not meet, the dilators devised by Kollmann are particularly

effective. The same difficulty is encountered in the wide prostatic urethra. Full dilatation is achieved here only by an especially constructed dilator, not by a sound.

The beneficial effect of dilatation treatment will be enhanced if we combine with it suitable irrigations. Dilute permanganate of potassium solution is effective; at times nitrate of silver and copper sulphate solutions act better.

In our urethral work we have now at our disposal the perfected urethroscope, carrying its own light at the tip of the tube, enabling us to inspect section by section every portion of the anterior and deep urethra; exact local applications can thus be made, incision performed under guidance of the eye, or engorged follicles punctured and treated electrolytically. It is of the greatest value to control the results of dilatation by urethroscopic inspection as taught by the Oberlaender school. The visible restoration of a congested and infiltrated canal to a state approximating the normal can not help but be grateful to the operator.

I wish, also, to draw attention to the fact that urethral illumination is a valuable mental stimulus to our patients, who at times become despondent and hypochondriacal. The visual control of the surgeon's work appeals to the patient strongly, as I have frequently verified.

To sum up, the advances that have been made in the method of primary dilatation of absorbable strictures are:

First: Exactly adjusted pressure to the part affected, if necessary by use of variously constructed instruments, the best of which, I think, are those devised by Kollmann.

Second: The location of the infiltrated area can now be diagnosed not only by the bougie but also by the urethroscope, and the progress of our treatment noted.

Third: The carrying of the dilatation to quite a high limit, to 30 F. in the penile and close to 40 F. in the bulb.

Fourth: The recognition of the extreme latency of the gonococci within this early infiltrated mass, and the necessity of their elimination from the diseased canal. This last is a matter of vital importance.

Most decidedly we should not be satisfied to dilate a canal merely for the sake of affording passage for a fair stream of urine, such as a diameter of 22 to 24 F. permits; but we should energetically attack that embryonal type of tissue deposited as the result of an acute inflammation and liable to result later in a scar-like mass with the usual cicatricial distortion and contraction. We must realize, though, that there are many

strictures entirely unamenable to our efforts of dilatation, and it is well to recognize this early and save our patients much unnecessary suffering. Dilatation here ceases to be the primary method of cure, but it still remains an indispensable adjunct as an after-treatment.

If we are confronted with a stricture not responding to dilatation, several ways of dealing with it are at present in vogue. The following methods have their advocates:

First: Internal urethrotomy. (Some exclude in this operation all strictures of the deep urethra; others apply it to any.)

Second: External urethrotomy.

Third: Combined external and internal urethrotomy.

Fourth: Forcible dilatation according to the method of Holt and Pereve.

Fifth: Immediate progressive dilatation according to the method of LeFort.

In their text-books Keyes and White & Martin express themselves as being opposed to internal urethrotomy in the deep urethra, whereas Taylor does a conservative cutting operation in this region, using the Maisonneuve instrument. I find, however, in recent European literature that many operators apply internal urethrotomy to all regions of the urethra, claiming good results and an extremely low mortality rate. Among them is no less an authority than Guyon. Good and persistent bladder drainage is the *sine qua non* of the after-treatment, and much of the success depends upon subsequent and long-continued dilatation.

Reginald Harrison is a warm advocate of his combined operation of internal and external urethrotomy. The perineal puncture is made after the internal incision, and drainage is permanently established through the opening. The claims are, and they are substantiated by many, that urinary fever is avoided, and that healing of the incision occurs more naturally and with much less production of cicatricial tissue, owing to the elimination of the baneful local effects of an irritating fluid like the urine.

No matter in what manner we choose to deal with a stricture, the subject of urinary and urethral antisepsis is of great importance. Unquestionably drainage is of inestimable value. All recent advocates of internal urethrotomy dwell upon the necessity of catheter retention until more or less wound closure has taken place. It is practically impossible to disinfect the urethra; the crypts and follicles permit of no such a thing, and the canal can be made only relatively sterile. Yet we should aim to get as near this as possible by using repeated irrigations of bichloride,

permanganate of potassium, silver nitrate, or some other active antiseptic. I can not permit the opportunity to go by without entering a protest against the customary boric-acid irrigation mentioned and advised in every text-book. Boric acid, even in concentrated solution, requires hours to make a deleterious impression upon any of the pus-producing cocci. As an irrigation the application is transient and fleeting. Not enough is retained in the canal to affect any organisms, and boric acid irrigations are simply sterile water irrigations. Taken by the mouth and lingering in the bladder for hours, its effect is decided and beneficial.

In very tight stricture, requiring filiform manipulation, it is evidently impossible to do any thing in the way of direct local antisepsis in the region beyond. Fortunately we have in the use of several internal drugs decidedly effective means of lessening the danger of urethral sepsis. The drug above all others that claims respect, and which is growing in popularity, is urotropin in five to ten-grain doses, repeated three times daily. Salol and oil of eucalyptus are also reliable urinary disinfectants. Urotropin, however, besides being a direct antiseptic when discharged in an altered state through the kidneys, has this most beneficial side effect, it relieves the alkalinity of a decomposing urine, and by rendering it acid prevents thereby the growth of most bacteria. In an acid urine the phosphates cease to be precipitated, ammonia formation is restrained, the bladder is relieved of chemical irritation, and the vicious circle is broken.

It is folly to continue in the old routine method of administering alkaline drugs in alkaline cystitis, which we often encounter with obstructive lesions of the urethra. To this Finger has recently alluded.

A few further points I would like to call attention to: In all stricture cases a uranalysis should be made. Albumen will nearly always be present, derived from the pus, and would mask a renal albuminuria, consequently casts should be looked for, and the condition of the kidney should guide us also in the choice of an operation.

Morphine when administered for pain should not be given in doses over one-third grain, as otherwise it may cause tenesmus of itself.

As a curiosity I may mention that suprarenal extract deposited upon the orifice of a stricture has enabled several operators to penetrate the hitherto impassable stricture.

In the choice of instruments for urethral work, opinions vary greatly. The French are partial to the use of elastic rubber bougies, and many German authorities also prefer them—Guyon, Gueterbock, and Posner use them exclusively. Others, again, on account of their cleanliness,

prefer metallic instruments wherever they can be used, among them Ditell, Antal, and Volkmann.

A very tight stricture may lead to the belief that the condition is practically impermeable, although the dribbling urine argues otherwise. Here we are debarred from using steel or stiff metallic instruments, and are limited to the use of whalebone or the woven silk filiforms. If the stricture is entered and a filiform is passed into the bladder, we have a choice of several ways of gaining further dilatation. Thompson recommended the tying in of a filiform for twenty-four hours or more, resulting in a pressure necrosis, the urine in the mean time dribbling away alongside. LeFort has brought forward his tapering steel sounds, the end screwing into a filiform; the sound follows the filiform through the stricture, and considerable dilatation can be achieved at once. The Banks whalebone filiform acts similarly.

Owing to the continual pain of dilatation, the bleeding and general discomfort, patients sometimes refuse farther treatment unless something more radical and more immediately productive of results is done. Consequently not only the theoretical applicability of certain operations must be considered, but the circumstances of the patient also. Dilatation is slow and extends over months. Those away from a medical center, who come for relief of chronic cystitis, etc., due to stricture, although in time dilatation would perhaps be the ideal treatment, often can not submit to the loss of time, and a urethrotomy becomes imperative.

In this connection it is interesting to note the opinions of several well-known surgeons as expressed in personal communications to me. Dr. N. Senn, of Chicago, in a letter dated February 3, 1901, writes as follows:

"First: The ideal treatment of urethral stricture is gradual dilatation.

"Second: External urethrotomy is indicated in all cases of stricture complicated by fistulæ, and when dilatation is either impossible or impracticable.

"Third: I never practice or advise internal urethrotomy,

"Fourth: Forcible dilatation has a limited field of usefulness."

Replying to the same inquiry, Dr. John A. Wyeth, of New York, wrote me that he holds to the views he expresses in his text-book, and referring to them, I quote as follows:

"Internal urethrotomy is applicable practically to all strictures anterior to the membranous urethra, while those of the membranous por-

tion, with rare exceptions, may be relieved by a modification of the same procedure.

"External urethrotomy or perineal section is indicated in the exceptional cases in which the stricture is so tight and tortuous that a dilating filiform can not be introduced to make way for the urethrotome; when a fistula or abscess complicates the stricture, and when the cicatricial tissue is so extensive that recontraction takes place after one or more trials of a less radical operation."

He recommends the use of the Banks dilating filiform bougie to obtain sufficient dilatation to permit the slipping through of the urethrotome. His modified cutting operation for the deep urethra consists in dilating with the Otis instrument, then cutting slightly, turning the instrument, dilating some more and again cutting, thus gradually restoring the full lumen of the urethra.

Prof. Wyeth most positively asserts that the danger of hemorrhage from internal urethrotomy thus applied to the deep urethra is *nil.* He has never had any accidents, and maintains that any bleeding may be readily controlled by pressure.

Regarding the external operation, he says further: "I am convinced that this operation is performed in a great many cases where a modified internal operation would give relief and satisfaction."

Taylor in his text-book recommends the use of the Maisonneuve instrument for fibrous strictures of the membranous and bulbous urethra. He advises against the use of the large blade, and is wont to cut only up to about 21 F., followed by subsequent dilatation up to 30 F.

Dr. Ap Morgan Vance, of Louisville, tells me that the Holt divulser is frequently used by him with most gratifying results, and he has no mishaps of any kind to report from its use.

It will thus be seen already that experienced operators hold very different views, and to get a more representative survey of the field I investigated current English, German, and French medical magazine literature, and have selected the following expressions of more or less prominent workers in this field:

Berliner Klinische Wochenschrift: Dr. Martens, in Koenig's clinic, calls the condition stricture only where connective tissue is pronounced; inflammatory swelling is not stricture. Finds most at bulbo-membranous juncture—67 per cent. Prefers metallic bougies for sounding; prefers dilatation up to 26 to 30 F., long continued. Those that resist dilatation must be cut. The internal operation is much used in France, and lately

is gaining in Germany. Catheter should be left in. In his own clinical work he always prefers the external operation. Statistics: 65 cases of dilatation, no deaths; 100 cases external urethrotomy, 8 deaths. Writer comments on lack of unity of opinion in choice of operations.

The same results may be achieved by different methods; what must be borne in mind is to avoid rough instrumentation, obtain a free outlet for the urine, and maintain a long-continued after-treatment with sounds.

Thirteenth International Congress of Medicine: Heresco comments on diversity of opinion regarding operations on the urethra. Regarding internal urethrotomy, he says that it is to be done for stricture due to gonorrhea when a sclerosis has set in. Dilatation is an indispensable after-treatment; the operation is done really only to facilitate dilatation. Recurrences may take place within several weeks to several years. External urethrotomy is advisable only in impassable stricture, fistulæ, indurations, and perineal callosities. Some surgeons have tried to have this operation supersede internal urethrotomy, maintaining that a cure is better accomplished. In the author's opinion this is not so, and in the literature he fails to find it evidenced. In external urethrotomy dilatation is as indispensable as after internal urethrotomy. He concludes that none of the cutting operations result in a cure of themselves. Internal urethrotomy facilitates dilatation; external urethrotomy does not cure any better than internal. Persistent and careful dilatation must follow all cutting operations.

Thirteenth International Congress of Medicine: Albarran mentions electrolysis, progressive dilatation, internal urethrotomy, external urethrotomy, resection, and plastic operations. Recurrences are rapid after electrolytic method; the slow method of electrolysis has little in its favor. Progressive dilatation is to be carried to sixty Benique; good results are obtained, but the caliber must be maintained by sounding at intervals. Internal urethrotomy gives better results when multiple incisions are made than a single deep one; recurrences will take place as after dilatation unless sounding is persisted in. External urethrotomy gives superior results, but is only applicable to a limited number of strictures. Resection in perineo-scrotal region gives good immediate results, which may persist without after-treatment. In pendulous portion resection may cause curvature. In strictures complicated with tumors and fistulæ, and in traumatic stricture, dilatation and internal urethrotomy are insufficient; external urethrotomy, or better, resection, is the operation of choice.

Reginald Harrison, Thirteenth International Congress of Medicine, commenting on the permanency of the results obtained by bloody-operations in the urethra for stricture, considers drainage of urine away from the cut surface an essential factor in obtaining good results; is an advocate of the combined internal and external operation. The divulsion method of Holt, of London, results in admirable cures in cases suitable for them—those where the infiltration is beneath the mucous membrane. Harrison has had occasion to examine after death several urethras operated upon by Holt's method, and the results left nothing to be desired. Many strictures are of the kind, though, where this operation is entirely unsuitable. Autopsy in 1900 on a case operated for stricture of deep urethra by Berkley Hill in 1883 by internal urethrotomy alone revealed no trace of the former stricture; the use of the sound had been given up several years before. Harrison regards this case as having been cured. In a case of relapsing stricture (five internal urethrotomies and one Holt operation) Harrison obtained a permanent result by combining the internal operation with the Maisonneuve instrument with a perineal puncture, removing all obstructive material, and draining through the perineum. The patient has remained free from stricture symptoms for ten years. Harrison concludes that in peri-urethral stricture of the deep urethra Holt's operation achieves good and lasting results. This operation is not indicated in stricture where the mucous membrane itself is the seat of the lesion. If all contracting fibers of a stricture are severed by an internal operation, permanent results may be achieved. Often relapses occur owing to formation of secondary cicatricial material resulting from operative wound. Drainage is of great value. Wound of internal operation heals better if perineal drainage is at the same time established.

Transactions of Seventy-second Meeting of German Naturalists and Physicians, held at Aachen, September, 1900: B. Goldberg strongly advocates the operation of internal urethrotomy for nearly all strictures, excepting only those where peri-urethral conditions exist, such as fistulæ, abscesses, and infiltration. He advises continued catheter drainage for several days, bladder irrigation every six hours, and antiseptic and aseptic precautions. He has statistics of a large number of cases. Out of two thousand three hundred and twenty-three cases he lost only seventeen. Hemorrhage he has never found alarming by his method; urinary fever is avoided by drainage. The results, he claims, are fully as good as by any other method. The operation, like the external operation, is simply a preliminary act to a curative dilatation.

Annales des Maladies des Organes Genito-Urinaries, No. 10, 1899: Guiard claims the best results to be obtained by dilating progressively the urethra up to 28 F. or higher. For the relief of the bladder and the obviating of urgent symptoms, dilatation to 22 or 23 F. is sufficient, but for a cure of the stricture higher numbers must be reached. Only a few cases of stricture prove rebellious to this treatment. He regards hemorrhage and chills as of no significance, and finds that they disappear as the stricture is treated. Relapses occur with less frequency, and the sound need be used eventually only at long intervals.

American Journal of Dermatology and Genito-Urinary Diseases, No. 3, 1900: F. Kreissl reports a case of traumatic stricture cured with electricity.

Lancet (London), March 17, 1900: Reginald Harrison gives indications for external urethrotomy:

First: In elastic and contractile strictures.

Second: When the internal operation does not yield sufficient drainage.

Third: In complication of stricture with fistula.

Fourth: In complication of stricture with extravasation.

Fifth: In septic conditions after internal urethrotomy. Necessary factors to success are the continued use of the sound, combined with the internal operation and sufficient drainage.

Presse Medicale, December 16, 1899: F. Guyon, writing on the indications for external urethrotomy, states that in his clinic within seven years the operation was performed forty-six times, against seven hundred and fifty-two internal urethrotomies. He regards the internal operation with more favor, and claims that the external operation is coupled with danger and inconvenience. Of his forty-six cases, two died, a percentage of 4.34; of his seven hundred and fifty-two cases, only nine died, a percentage of 1.01. The external operation demands a bed rest of six to eight days, then dilatation commences; the time consumed altogether is about twenty to twenty-five days. Guyon absolutely refuses to indorse the statements of those who claim that the ultimate results of an external urethrotomy are better than those of an internal operation. The advantages of the operation of internal urethrotomy are the quickness of its execution, the doing away with general narcosis, the extension of the operation to the whole urethra. He regards the Otis urethrotome with disfavor, claiming that it may cause severe hemorrhage.

Journal des Prac., No. 16, 1900: Poncet and Delare recommend the operation of urethrostomia perinealis in the very severe and inveterate

cases of stricture. The urethra is severed behind the stricture and stitched in the perineal opening. Urination is voluntary. Their results have been satisfactory.

From all this it appears that various operations in the hands of experienced operators seem to yield similarly good results; that the dangers of an internal urethrotomy, the deep urethra included, are exaggerated, but that much depends upon careful after-treatment. The essentials necessary are perfect urine drainage, aseptic condition of the urine brought about by the use of urotropin or salol, and regular dilatation with full-sized sounds for a long period after the operation.

External urethrotomy is at times an indispensable operation, but is often unnecessarily done. The inconvenience of the operation must also be taken into account. Good authorities claim that relapses after it occur as frequently as after any other, and dilatation is as necessary. It must be borne in mind that local anesthesia, or even no anesthesia, will suffice for an internal operation, whereas for an external urethrotomy general narcosis is required. The combined internal and external operation is a procedure which is rising in esteem.

Arguing from my own experience, I have this to say, that stricture is at times a serious surgical malady, and at all times merits our most scrupulous care, and never should a hasty or slipshod operation be done. I say this because we often do find a lack of surgical tact and discretion, and an ignoring of ordinary precautions against infection and hemorrhage that is astounding. I prefer in all cases where a stricture is absorbable by pressure alone to use dilatation. Circumstances will compel us, though, sometimes to proceed in a more rapid manner and do a urethrotomy as a means of avoiding recurrent chills and persistent bleeding that might complicate early dilatation.

I have no particular fear in applying the conservative cutting operation to the membranous urethra. I am much opposed to making a deep incision here. It is not possible, I think, to aim at and sever all the contractile bands, as we can not tell how deep they are, compelling us to cut perhaps too deeply.

I look upon internal urethrotomy simply as a means to facilitate dilatation. The indications for external urethrotomy have been stated clearly by the extracts from the articles of Harrison and Wyeth. I believe this operation should be restricted, and feel thoroughly convinced that it is often unnecessarily done. Divulsion according to the method of Holt I have never practiced.

In my internal urethrotomies I have never encountered uncontrollable hemorrhage, and if the patient is given the attention he requires I believe that death from hemorrhage is well-nigh impossible, and could occur only in a case of hemorrhagic diathesis.

The vigorous preliminary use of urotropin has been most effective in my experience in combating urinary sepsis. I have operated upon relapsing cases occurring after external urethrotomies, having done this operation myself only when the indications were absolute.

The method of dealing with stricture by electrolysis has a few advocates, but it is heartily condemned by others. I have applied the electric current myself to strictures, and have obtained some slight results. These results, however, were limited to getting through the stricture, and not productive of any real cure. Several strictures that have resisted filiform manipulation have yielded to steady pressure of a rather large blunt negative electrode, and an entrance was effected into the bladder, paving the way for further dilatation. The liberation of sodium hydroxid at the negative pole exerts a caustic effect upon the tissues, and, in my opinion, would predispose to further scar formation in an undesirable manner were the electric treatment used alone.

In closing, I will simply mention the most serious surgical interventions that the urethra is subjected to for obstructive lesions. They are: Retrograde catheterization, with an accompanying suprapubic cystotomy; the external operation without a guide; the method of approximating the cut urethra to the edges of the opening into the perineum. Fortunately, conditions meriting these operations are rare.

DISCUSSION.

Dr. WATHEN, JR., Louisville: I listened with much interest to the doctor's splendid paper, and I think he has dwelt in detail on a great many of the methods and opinions as regards treatment of stricture of the male urethra. We must not forget, however, that in all these methods the personal equation of the individual operator enters into play. One man will often have success with a method which, in the hands of another man, would prove a complete failure. That has been demonstrated time and again. In that connection the doctor has left out one or two points which we shall especially consider. One is in cases where we have a very small stricture, accompanied by retention of urine. We see this man after the general practitioner has probably cocainized the urethra and tried to introduce the sound. He has a distended bladder, and suffers much pain. These cases should be treated according to the more modern methods.

The introduction of sounds is not only painful but unsuccessful. We should first relieve the man of his pain by giving him a dose of morphine, and after that we should introduce behind the pubic bone an aspirator and draw off the urine from the bladder. The next step is the washing out of the urethra, and then continue our work with the use of endoscopic appliances. The endoscope should be introduced slowly and carefully, and then the stricture and the false passage can easily be located. This can easily be done if your illumination is complete. You can then introduce a filiform bougie, dilating the stricture, and after this one of Goulet's catheters and guide. We can easily withdraw the urine by this means from the bladder without any blood or mucus.

Another point is the after-treatment of these cases. During this time we frequently have bad results. Strictures have been cut and strictures have returned. Why is this? There must be a reason for it. I have seen many of these cases that will go home apparently cured, only to return within a short time with another stricture. The reason for this is that we have not advised them properly. If we have them in the city where we can dilate them every few days for a year or two, we can greatly dilate the stricture and prevent its recurrence. But in the case where we see the patient only for a few days the stricture almost invariably returns.

I always use the acorn sound. Take the largest sound which the patient can readily retain. Always perform a meatotomy first before you attempt to pass the sound. The passage of this sound produces a different dilatation from that produced by the passage of the straight sound. It is being used more in this country and in Europe at the present time than ever before. When you have discharged your patient, give him a sound which is a size larger than the one last used.

We should pay more attention to the after-treatment of strictures than we have. We should always caution these patients to pass the sound continually, and to return to us occasionally so that we can see how they are getting along. Of course, much depends upon the individual case and the personal equation of the operator.

Dr. WILLIAM R. BLUE, Louisville: I simply wish to say a few words in regard to strictures of small caliber and almost impermeable strictures. My experience has been that when a patient can void water, whether he has fistulous openings or not, that by careful manipulation the filiform bougie can be easily passed into the bladder. By following this with a Maisonneuve the stricture will entirely disappear.

I do not agree with Dr. Wathen in the after-treatment. We know that the steel sound acts as a tonic on the diseased mucous membrane of the urethra. It certainly tones it up. The patient will complain a great deal during the first few introductions of the sound, and frequently call for a local anesthetic. After the fifth or sixth application the instrument passes in without even causing the patient to frown.

Dr. Koehler mentioned urotropine as a sterilizer. I wish to call attention to another compound, which is a great deal cheaper and gives as good results as urotropine, an important item. I have used cystogen for some time with very good results.

Dr. F. J. YAGER, Campbellsburg: I have been very much interested in the doctor's paper, and have followed his thoughts very closely. I think that these operations are freqnently done too hastily. We do not give nature time to develop and show her influence. I have had many of these cases, and my results have always been perfect. I have tried all the different methods and remedies that have ever been proposed. I have had these strictures occurring in all parts of the urethra. I want to tell you about a case which occurred in the practice of a young man who was a very bold slasher. He got into trouble, and he sent for me in consultation. The stricture was located about midway, and was about an inch and a half in length. I could not get any thing into the urethra, and the bladder was very full, and the man could not void any urine. We anesthetized him, and I tried to introduce catheter after catheter until I finally got to the very smallest size. After much effort I finally succeeded in passing it into the bladder. This case simply illustrates that we must have patience, and that we must take time to do this work. We must never go at it hastily and cut when some simpler method will prove more effectual.

Dr. AP MORGAN VANCE, Louisville: For a number of years I have used the Hacker instrument, and I think it is one of the best which can be used in many of these cases. It is a small instrument with two blades, the dilating bougie entering between the blades rather than by forcing itself down into the mucous membrane and doing injury. It is an old instrument, but a valuable one, and better than more recently devised instruments.

Dr. Wathen said that when he got an impermeable case of stricture, he chucked in a dose of morphine, and then aspirated the bladder. I would suggest to him to aspirate the bladder first, and then he would not need the morphine. It is absolutely useless to give a dose of morphine when there is no call for it.

Dr. KOEHLER (closing the discussion): Cystogen and urotropine are identical. They have the same effect. I can not agree with Dr. Wathen as to the use of the acorn bougie. I find that the straight sound or specially constructed dilator produces less pain than the acorn tip. I have used them both, and prefer the straight sound.

URETHROSCOPY.

WILLIAM R. BLUE, M. D.
LOUISVILLE.

To the untiring efforts of Grunfeld, of Vienna, Fenwick, of London, and Otis, of America, is due the position the urethroscope now holds as a means of diagnosis and treatment of urethral diseases. As a diagnostic agent, what does it do? First, with a proper light it enables us to see the entire urethra and locate any abnormal condition of same. Second, with it and only with it are we able to differentiate positively between organic and spasmodic stricture. This I consider of great importance, especially if a radical operation is advised for the treatment of the stricture. There is no doubt in my mind that thousands of spasmodic strictures are incised annually when such an operation is not indicated. It is really harmful, and could be prevented by the use of the urethroscope. Third, some of you have met with cases of close stricture in which you have been unable to pass the smallest filiform bougies after a lengthy trial, though an opening be present. By illumination with the urethroscope pressing against the band, in all of these cases you are sure to find the opening and pass the bougie into the bladder, thus saving the patient an external operation.

As an aid in treating chronic urethral diseases, I can not say too much in its praise. I have had a number of cases in which it has enabled me to effect a cure when all of the other modes of treatment had failed. With the urethroscope we can see and treat the following conditions as well as if they were on exposed surfaces: Granulations, mucous patches, urethral chancroids, hypertrophied follicles and abscesses, nodular strictures, curvatures of the penis, and polypi.

I will cite only two of the many (to me) interesting cases I have treated. Without the urethroscope these patients would still be sufferers:

CASE I. Mr. X., from western part of the State, aged thirty-eight years; married; has two children. First attack of gonorrhea at eighteen years of age. Discharge ceased after eight weeks' treatment. At twenty-four years he had a second attack. This stayed with him for two years. Consulted physician, who located three strictures. Radical operation was performed. The patient stated that the surgeon cut the

entire pendulous urethra on roof. Hemorrhage was profuse. He was sounded for two months at intervals. Has had slight discharge since. Following the operation pain came on, which was referred to the bladder neck. This had been present ever since. He consulted another surgeon for his complaint. After carelessly examining him he pronounced it neuralgia of the prostate. He was advised to avoid sexual excitement, and told that the pain would "wear off" in time.

Eighteen months ago he came to me for treatment. Examination of his urine found it to be normal, barring a few pus and epithelial cells. Boric acid was given in five-grain doses every four hours for twenty-four hours before the examination, and kept up during the entire treatment. Patient was cocainized and 30 F. urethroscope introduced. Four inches back an ulcer was found on the roof of the urethra about an inch long and one eighth of an inch wide at its widest point. After mopping it off I carried my index finger along the lower surface of the penis to the end of the urethroscope; there I exerted pressure with the end of my finger and told the patient that was the seat of the trouble. He remarked that I was right, and that it was the first time it had been located. Application of stick sulphate of copper was made to the ulcer daily with no change. I curetted it under cocaine and applied the copper as before. In three weeks the ulcer healed, only a slight scar remaining. Saw the patient in March; there has been no return of his symptoms.

CASE 2. Mr. W., local, single, aged twenty-six years. First attack of gonorrhea at twenty-two years of age. This was complicated with chordee, which he broke. Wound healed, leaving the penis curved downward and slightly to the right. After preparatory treatment similar to Case 1, he was cocainized and examined with No. 22 F. urethroscope. One inch from the meatus I found a stellate cicatrix. Curettage of cicatrix relieved the curvature, wound healing quite promptly. Patient has since married and has an heir.

As to urethroscopes: I have tried nearly every kind on the market. The most satisfactory one is the Schall. With this instrument you can study the urethra as a cylinder, and not as a collapsed tube with its many folds, as you see it with other makes. This is a very important point, for frequently the diseased condition lies lurking in the urethral folds, and is often overlooked with other makes of the urethroscope.

Show me a genito-urinary surgeon without the knowledge of urethroscopy and I will prove him to be a man who is deficient in his

work, fails to get results in his treatment, and loses annually a number of his patients whom he might cure. To you who contemplate doing urethroscopic work, and those who have been doing it and are not pleased with their results, let me suggest perseverance. Never hurry through your examinations, but examine every part of the urethra carefully, and your reward will be in proportion to the carefulness of your examination.

VACCINATION.

A. D. PRICE, M. D.
HARRODSBURG.

As the years come and go, as the peoples of the earth multiply and intercommunication increases by means of rapid transit, the importance of vaccination grows apace.

There is nothing new to offer you on this important subject. The object of this brief paper is to elicit discussion on the most perfect and certain preventive measure known to the medical world, to urge upon the profession the importance of teaching the public, at all times and under all circumstances, the necessity of being rendered immune to smallpox, the most dreadful of all diseases, and to learn from the individual member his experience relating to the complications that have occasionally followed vaccination.

It is surprising to know how quickly a community becomes unprotected against smallpox. Children are born and grow to be men and women without the protection of vaccination; many even go through life without giving it a thought till confronted with the contagion. The medical profession only can remedy this sad condition by teaching the public its importance, and by urging upon the lawmakers the necessity of enacting laws to secure its adoption.

The prevalence of smallpox in various sections of the country, and its liability to develop in any locality, render this subject of special interest at this time. Were every person properly vaccinated and revaccinated at stated intervals, smallpox would become an unknown disease. This is proven to be true by the results in communities where these regulations are enforced by law. The necessity, then, of urging and securing the universal adoption of this life-preserving measure is imperative.

Only the healthy should be vaccinated. Those in ill-health, those exposed to acute infectious diseases, and the subjects of chronic dermatoses should not be subjected to this procedure unless there has been an exposure to the contagion. Every child should be vaccinated when two years old, revaccinated in five years, and thereafter every ten years. It may be done, however, at any age if necessity requires.

The virus should be pure; the glycerinated calf-lymph only should be used. "The lymph properly prepared with chemically pure glycerin and sterilized water, and sealed in sterilized glass tubes, is found free of the various streptococci and staphylococci, of the streptococcus of erysipelas, and of the bacillus of tuberculosis," and is, therefore, devoid of danger.

There are a number of vaccine establishments that furnish reliable lymph; the supply is abundant and readily obtained. Bad complications militate against vaccination; only the physician, therefore, should perform it, and his technique should be thorough, and every precaution taken to prevent subsequent infection. The patient should be under observation and inspected at frequent intervals until the danger of complications is passed.

Vaccinal immunity, it is claimed, is less than 1 per cent, and smallpox immunity has been demonstrated to be acquired in ten days after vaccination. "Vaccinia is an acute infectious disorder which ordinarily runs a mild and uneventful course," but grave accidents, often due to other causes, sometimes arise.

Unfavorable conditions may develop in cases of diabetes mellitus and hemophilia. Pustules may become hemorrhagic; adenitis, ulceration, abscess, septicemia may at times be serious complications; erysipelas and tetanus may be the result of inoculation. Gangrene, otitis media, nephritis, convulsions in children, neuritis, keloid and various dermatoses have been laid to its charge.

General vaccinia is the result of the virus being transported by scratching or by the blood-current. Tuberculosis, according to some observers, is possible, not probable. The occurrence of syphilis is impossible where the bovine virus is used, and consequently does not demand any consideration. "The more complete the vaccination the greater the protection." The virus should, therefore, be thoroughly inserted in three or more places. The physician, in doing vaccination, should be as careful as in the performance of a capital operation. Clean hands, clean arms, clean instruments, aseptic dressings are

imperatively demanded. The old haphazard and unscientific method is responsible for many of the unfortunate complications.

To teach people how to live, how to avoid disease, how to grow old gracefully, peacefully, and happily is a matter of continual and persistent education. To the medical profession belongs this duty, and it would not shrink from it if it could. The general practitioner and the obstetrician should, therefore, see that the families under their charge are properly vaccinated and revaccinated.

Hospital authorities should require all patients to be vaccinated before being discharged; no child should be permitted to enter school until vaccinated. Vaccination and revaccination should be made compulsory. By persistent, honest, earnest effort the profession can accomplish this; none other can.

DISCUSSION.

Dr. THOMAS J. SHOEMAKER, Morganfield: It seems almost farcical to get up and talk to doctors about general vaccination. If we could reach the people and get them to understand the importance of it, we might do some good. All I hope to do is to urge on the physicians to see the people at home and urge them to be vaccinated. The time was when vaccination might have been dangerous. With the old method of vaccination there was some danger of communicating the disease from one to the other, but under the present conditions of cleanliness vaccination is so safe and simple that any one can do it if he has plenty of soap and water and a sterile needle. The great trouble with smallpox in the country is that people are vaccinated and revaccinated until you hardly get a case of severe smallpox. You may probably see a hundred cases of smallpox without ever meeting a confluent case.

The negro race are much more susceptible than the whites, and they often have a light case of smallpox which does not confine them to bed. They run about indiscriminately, and often inoculate the whole country. The whites may escape for a while, but in a short time they will get it. Last year I saw a number of negroes walk up to the polls to vote while they were broken out with smallpox. A short time afterward a number of the whites broke out with the disease. It is my opinion that vaccination should be made compulsory on the negro race. They should be treated with the utmost stringency in this matter. I have often seen them lick off the vaccination with their tongues immediately after it was done. It would be well to make them believe that to put their tongues to it means death. They do not propose to be vaccinated. A great many people will tell you they would rather have smallpox than be vaccinated. It is because they are vaccinated carelessly, and as a consequence their arms get very

sore, some constitutional disturbance results, and they blame vaccination for it. If vaccination is done carefully and properly, and if the patient takes good care of it, there is no more danger in it than there is taking a drink of water.

The vaccination must be performed under the strictest aseptic precautions, just as are observed by the surgeon when he operates. Infection is very liable to follow, and then the patients get quite sick, and they advise everybody not to be vaccinated. That is where the trouble lies, and the doctors are the ones to remedy it.

Dr. F. J. YAGER, Campellsburg: You have no idea of the conditions existing in some parts of this country with regard to vaccination. The people seem to have absolutely no knowledge of the evils resulting from non-vaccination. Smallpox is a terrible disease, and it seems ridiculous that people will not accept something which will give them immunity from such a disease. Doctors usually do not call the attention of their patients to the great benefits which are derived from vaccination, because they are the people who can induce their patients to submit to vaccination and revaccination if necessary.

Dr. R. B. GILBERT, Louisville: The American Anti-vaccination Society of Boston have managed to have representatives in almost every State of the Union and in every large city. Dr. McCormack, in discussing medical organization, might include organization against that society. They have a representative right here in Louisville, although he takes very little interest in it.

Dr. ———, Louisville: I have found that our matrons do not object to having their children vaccinated, but object to bringing them to the doctor five or six times to have the vaccination certified to before the children can go to school. I have a child now perhaps should not be in school because I do not believe that it is immune, if it is necessary that vaccination should take before the child is immune. The child, to my knowledge, has been vaccinated four times without its having taken, and I would like to have some one tell me what is the cause of the vaccination not taking, and how it is to be remedied. Parents are very anxious to have their children vaccinated, but they do not like a repetition of the act.

Dr. J. N. McCORMACK, Bowling Green: This is a very important subject to every citizen of this State. The failure to enforce vaccination has cost the various towns and counties in Kentucky in cash over $300,000. It is my opinion that not half the people in this State are vaccinated. In the majority of instances there is no active opposition to vaccination. I do not believe that the influence of the anti-vaccinationists has been very great in Kentucky. I think it has been due more to indifference than to ignorance. We have authority under the present law to enforce vaccination all over the State. The Boards of Health of the different towns and counties have full authority to enforce vaccination, and we are exercising that authority everywhere. They have authority to enforce vaccination of every man and

his family within twenty-four hours, with a penalty of $100.00 a day until they are vaccinated, and I have never seen the man yet who paid one fine. He invariably got vaccinated before the fine was set against him.

I believe the profession should take this matter up all over this State with their people and urge the necessity of vaccination. I do not believe that it is generally known that every child must be vaccinated before it is six months old, and that every corporation in the State employing people must require a certificate of vaccination from its employes. It is also unlawful for any person to attend school without a certificate of vaccination. Therefore, it only remains for us to do what the law has given us the power to do.

There are two or three ways of accounting for the failure of a vaccination to take. Many of your drug houses here in Louisville pay no attention whatever to the age of their vaccine. That has happened over and over again. The physician usually fails to look at the date which is stamped on every bottle or package. I have had several complaints from the vaccine firm because a great injustice had been done them through these drug houses. The Henry Drug Company, which has been our agent and of whom I expected more, have sent out vaccine which was months out of date, plainly printed on the packages, and, of course, the attempt to vaccinate was a failure. In the presence of smallpox such an act is an outrage which it is difficult to characterize. A man's family exposed to smallpox is entitled to protection when he employs a doctor to vaccinate them, and to have this stuff palmed off on him is a commercial offense.

I am satisfied that another common cause of failure is that the vaccine is not kept in a cool place. The express companies ship the vaccine in a hot express car, and heat, as you know, very soon spoils the vaccine. This is a very frequent cause. Another is that doctors frequently carry packages in their vest pocket, subjecting it to the heat of the body, and it is soon destroyed. The vaccine should be kept in the coolest possible dry place, but above all things you should know that the vaccine point which you are using is not out of date. All the different vaccine firms will replace the old virus with fresh virus without extra charge. They want to do it to preserve their reputation, and they should have the opportunity of doing so. If you will make these statements to your drug house, I am sure that they will be appreciated, because many druggists do not know that this exchange will be made.

Dr. ————, Louisville: The trouble is that those people who refuse to be vaccinated are usually the poor and ignorant classes. What good will it do to fine a man who has not a nickel to his name? I think a law ought to be enacted to imprison this class of people who are too poor to pay the fine. That is the only way, it seems to me, by which we can enforce vaccination.

A GUNSHOT WOUND OF THE RIGHT LUNG WITH COMPLICATIONS.

A. M. MORRISON, M. D.

GOSHEN.

I was called October 27, 1897, to see Jimmie Taylor, colored, twelve years of age, who a few hours previous, while out hunting with a shotgun loaded with full charge of powder and No. 5 shot, after climbing a fence, with his hand on the muzzle, attempted to pull the gun through the fence after him, when the hammer caught on a board and one barrel was discharged, the contents entering his right chest, fracturing the sixth rib near its cartilaginous attachment, and inflicting an ugly wound with extensive comminution of the rib. The entire charge of shot then entered the cavity, wounding the base of his right lung. None of the shot passed entirely through the opposite chest wall, but seven or eight shot were found under the skin near to and beneath the right axilla, and were removed.

I found the patient with cough and labored breathing with expectoration of a bloody mucus, and with every expiration a free discharge from the wound of a bloody, frothy mucus, with every indication of extensive lung lesion. The patient was living with his grandmother, "Aunt Liz," in a small cottage with seven or eight other members of the family, and the house and surroundings decidedly unsanitary. I had him placed on a cot in the middle of the room, and observed all the rules of hygiene and cleanliness possible under the existing circumstances. I then proceeded to dress the wound, first removing several spiculæ of the fractured rib, and then packed the wound with a ten-per-cent iodoform gauze, with compress of gauze and absorbent cotton, and then applied a moderately tight bandage. I directed an opiate to be given him at bedtime if restless, or if his cough proved troublesome. On visiting patient, October 28th, I found he had a fairly comfortable night; there had been quite a free discharge of bloody mucus. I packed the wound with gauze and dressed as on first visit. Pulse 90, temperature 100° F., cough less frequent, and had some appetite. I continued my visits daily, and dressed wound in same manner until November 2d, when I found a large accumulation

of straw-colored serum filling the pleural sac, and on removing the dressing he would cough and eject this fluid from the wound with great force. By changing his position on the cot and using a flexible rubber catheter I could syphon off most of this fluid. At this time he had an expectoration of rusty sputum, and on examination I found one half of his right lung hepatized, showing a traumatic pneumonia; his pulse was now 110, temperature 102⅜° F., respiration 44 to the minute, tongue heavily coated, and bowels inclined to constipation. Gave him carb. ammonia and tinct. digitalis until the pneumonic trouble was much improved, also gave him Rochelle salts to overcome the constipation of his bowels.

On the 9th of November I found empyema had set in; he now had a free discharge of pus from the wound, which was at times bloody in character. I then gave him two and a half grains of quinine every four hours, and fifteen drops tinct. ferrichlor. three to four times a day, and continued a liberal diet. On the 13th of November found his breathing labored and 52 to the minute, pulse 130, temperature 104½° F.; his general symptoms indicating a septic condition.

On November 14th I visited him with my son, Dr. J. Rowan Morrison, when after a careful examination we decided upon a resection of the rib and a thorough drainage of the pleural cavity. He was placed upon a table in the room, and having some doubt as to the safety of ether or chloroform, and not having cocaine to be used for local anesthesia, we concluded to employ ethyl-chloride. Dr. Morrison applied freely the anesthetic over the eighth rib posteriorly, when I removed two inches of the rib, punctured the pleura, and inserted a rubber drainage-tube secured with a large safety-pin. This was followed by a discharge of ten or twelve ounces of pus. We then washed out the cavity thoroughly with a solution of permanganate potash, and continued dressings of iodoform gauze. The patient stood the operation well and with but little pain or shock. In a few days I noticed quite a favorable change in his condition; his respiration was less labored and only 38 to the minute, pulse 110, and temperature 101⅜° F. Continued quinine and tinct. ferrichlor., and added milk punch. From November 14th to December 4th I irrigated almost daily with the permanganate solution, using from one to one and a half gallons. On November 18th I omitted the quinine and put him on Scott's Emulsion of Cod Liver Oil, as he had for several years previous to his accident shown marked symptoms of pulmonary tuber-

culosis; his mother, sister, aunts, and other near relatives having died of consumption.

On visiting the patient on December 4th I was surprised and no little disturbed in mind at not finding the strip of gauze still used in packing the shot wound. The wound had now granulated and nearly healed, leaving a tortuous opening about one sixth of an inch in diameter. The last strip of gauze used was only seven inches in length by two inches in width. For several days I had been rather careless in dressing the wound, and had on several occasions failed to secure the gauze to the bandage. The drainage-tube had been removed several days before, and both wounds were nearly closed. I made a careful examination with probe and forceps, but was unsuccessful in finding the lost gauze. I now concluded to "trust to luck," with a hope that it would in the end "show up," but I must confess to having been greatly worried and to have passed many sleepless nights in consideration of what would be the probable outcome resulting from my culpable carelessness. I was satisfied in my mind that the gauze had been drawn into the thoracic cavity.

The patient steadily improved, and on the 10th of January, 1898, was able to leave his room and walk out in the yard. By April 1st he had regained his flesh and strength, and was able to do some light work, though he still had a dry cough, with at times prolonged paroxysms attended with slight expectoration of mucus, and often with a feeling of choking or suffocation. During the month of October he served me as office and stable boy, and most of this time his cough was troublesome; frequently had severe and prolonged paroxysms, in which he would almost suffocate, and would be left in a weak or exhausted condition. My suspicions were now roused, and I feared the strip of gauze was a factor in the case; was probably giving rise to the severe and suffocative attacks of coughing. I sent him home about the 1st of November.

He attended school near the home of his grandmother in November and part of December, 1898, and while in the school-room on December 10, 1898, he had a severe attack of coughing, and on permission of his teacher he went out in the yard, where he continued to cough for several minutes, until, as he said, "he thought his eyeballs would pop out of their sockets." Finally he coughed up something into his throat, which he caught hold of with his thumb and forefinger, and which he pulled out of his mouth and threw on the ground with fright

and disgust. Finally he mustered sufficient courage to pick up the monster and run home with it to his grandmother, who carefully wrapped it in a piece of paper and locked it up in her "chist," and a few days later when passing her house she called me in and gave me the *long lost strip of gauze.* I think I can positively declare its identity, and that it was concealed in the lung or thoracic cavity of Jimmie Taylor from December 4, 1897, to December 10, 1898—over twelve months. When expelled, the gauze was round in shape with both ends pointed, and covered with a thick, inspissated mucus, and resembled very much in appearance a large lumbricoid worm. I can not say positively by what route it traveled, but it certainly reached the larger bronchi and was expelled in the manner described.

What pathological changes occurred in the lung and pleural cavity I can not determine. My belief is that the gauze was drawn into the thoracic cavity in a deep or forced inspiration, and coming in contact with the lung wound adhered to it, and was forced gradually into the lung by the contraction and cicatrization of the wound. I may be criticized for not enlarging and opening into the thoracic cavity and making a more thorough search for the lost gauze. I now believe my efforts would have been unsuccessful. Having a strong and abiding faith in the *vis medicatrix naturæ*, I concluded it would be safer to await developments.

I have made careful search of the text-books and literature, but have been unable to find recorded a similar case.

I am impressed with one fact, that whereas for several years before this accident the patient was decidedly, and I think beyond doubt, tuberculous, as evidenced by cough, great emaciation, night-sweats, with apparent disintegration of the apex of his right lung, his condition is now much changed and improved, he is free from cough, and to all appearance is a stout and healthy boy.

In conclusion I will ask, is it probable that the ten-per-cent iodoform gauze remaining so long in the right lung could have exerted a germicidal and healing influence over the diseased apex of that lung?

REPORT OF TWO CASES OF ANEURISM.

J. L. ATKINSON, M. D.

CAMPBELLSVILLE.

I bring you nothing new. This report is offered only to emphasize some cases of aneurism that are not easily diagnosed, and in which a false diagnosis might lead to serious results.

By way of preface, during my student days, while attending Dr. D. W. Yandell's clinics, a young man was brought into the clinic with a tumor on the forearm, ulnar side. The tumor was as large as a large cocoanut, and had been examined by three competent men, all of whom pronounced it a solid tumor. Acting upon that diagnosis, which was concurred in by himself, Dr. Yandell opened the tumor by a deep and long incision, with one stroke of the knife, without having made any previous preparation for controlling the hemorrhage. Some clots rolled out, and there followed a stream of blood that deluged the operator; a large aneurism had been unwittingly opened. After proper attention to the emergency in hand, Dr. Yandell turned to his class and said: "Gentlemen, you get an important lesson from this case; always be prepared for the greatest amount of hemorrhage." The case made a lasting impression on my mind.

CASE 1. In 1896 Dr. C. D. Moore, an ex-army surgeon and a man of more than ordinary ability, referred a case to me of a young man about seventeen years of age with a tumor about the size of an ordinary lemon on the left forearm, at about the juncture of the lower and middle thirds, over the ulnar artery. Dr. Moore gave me his opinion that it was a solid tumor. The tumor was very tense but slightly elastic; it caused a great deal of pain, but was not tender on pressure. There was no fluctuation or bruit, and prolonged pressure did not affect the size of the tumor. Aspiration gave negative results. I applied an Esmarch bandage on the proximal side of the tumor and opened it, finding a cavity filled with fibrinous clots. The diagnosis was then easily made. The cavity was cleaned out, the vessel tied, and the patient cured.

CASE 2. In October, 1899, Dr. B. T. Black asked me to see with him a colored man, forty years of age, with a large tumor on the inner aspect of the left thigh just below Hunter's canal. The tumor had first appeared about four months previous to that time, but had subsequently reduced somewhat in size, and the man went about his work. About two weeks before I saw the patient the tumor increased considerably in

size and became quite painful. The doctor was having it poulticed, as he thought there was an abscess impending. I found a tumor as large as a small cocoanut, quite tense, somewhat elastic, no pulsation, no fluctuation, and no bruit. There was no local elevation of temperature over the tumor; the whole lower half of thigh was edematous. I could find no pulsation in the popliteal artery, and the leg indicated impaired circulation. After a careful examination I expressed the opinion that the case was aneurism of the femoral artery, and proposed ligation in Scarpa's triangle, to which both the doctor and patient consented.

The second day afterward we returned to the patient's home prepared to operate, inviting some other of our town physicians to be present. An older physician, who went out with us, made a careful examination of the patient and expressed a dissenting opinion, and strongly advised non-interference. His counsel prevailed with the patient. I saw nothing more of the patient till the latter part of August, 1900, after he had been to consult a physician in a neighboring town. That physician gave it as his opinion that the tumor was a sarcoma, and that the only treatment that promised relief was a high amputation, as the bone was probably involved. The man came home and became a patient of Dr. H. G. Sanders, who called me in consultation September 29, 1900. I found that the tumor had grown to large dimensions, extending from the knee to the apex of Scarpa's triangle, and presenting the same characteristics as before; except at the most prominent part, corresponding to the original site, was a softened area, but it was not fluctuating. The patient was then suffering a great deal of pain. I made a careful examination and affirmed my former opinion, and again advised ligation and emptying the sac.

The patient was very much at sea on account of the diversity of opinion of the doctors, and declined to have the operation done at that time. He continued to suffer till on October 4th I was again sent for, and the patient begged for immediate relief. With the assistance of Dr. H. G. Sanders I proceeded to operate at once. I made an incision as for ligation in Scarpa's triangle, placed the ligature in position without tying, caught the artery below the ligature with forceps, and then opened the sac by free incision. With my hands I scraped out more than a gallon of tough, laminated, fibrinous clots. A cavity was found extending from the apex of Scarpa's triangle to the knee, and involving the whole inner side of the thigh to that extent. It would have easily accommodated a child's head at its largest part. I then tied the ligature, cleaned out the cavity well, packed, applied a compress and bandage, and put the patient to bed. He made a good recovery, and is now a well man with two good legs.

HEADACHES: THEIR NON-MEDICINAL TREATMENT.

CURRAN POPE, M. D.
LOUISVILLE.

If printer's ink is to be taken as the criterion of the needs of a country or community, if its extent and persistency are any indication as to the needs of the inhabitants, then certainly there is to-day among the people of America abundant evidence of the prevalence and persistence of cranial pain. Wherever we turn and wherever we would go we are confronted with the glaring poster or colored card indicating to the passing eye the relief of a symptom that must be so common and so frequent as to have impressed its importance and its needs upon the superficial and casual observance of the populace. From another standpoint it evidences a certain futility in medication of head-pains, and it behooves us as physicians to consider and reconsider the question as to whether we are really and radically reaching the roots of this disorder that now pervades our Commonwealth from one end to the other. The subject is not one that can be lightly studied, and it is certainly one that merits a symposium of papers on the subject.

To thoroughly understand any question of this character, especially a symptomatic disorder, and to thoroughly and carefully treat the question, we must adopt a classification, and for the purpose of this article I have adopted the following:

Headaches. Organic: Acute—Meningitis, tumor, syphilis. Chronic—Abscess, arterio-sclerosis, traumatism.

Functio-nutritional: 1. Hemic headache—(*a*) Anemia, (*b*) Congestion. 2. Diathetic headache—Gout, rheumatism, diabetes, uremia. 3. Reflex—Ocular, naso-pharyngeal, auditory, sexual. 4. Neuropathic—Neurasthenic, hysteria, epilepsy. 5. Gastro-intestinal—Gastric, intestinal, constipation. 6. Toxic headache—Alcohol, tobacco, coffee, lead.

The writer realizes that in this classification there are many flaws, and a good many headaches are left out, but for a practical working basis it is sufficient.

In the first or organic class the therapeutic field is of necessity very much narrowed, and the results obtained are usually unsatisfactory and more or less euthanasic. Generally speaking, the organic headache is constant, with variations from slight to extreme and severe paroxysms, but the pain rarely intermits, and becomes such a prominent symptom as to prevent sleep. In organic headaches it is not an indefinite pain, and is one that is easily increased by any thing that raises blood-pressure; usually cessation of the pain is due to destruction or to a removal of the cause. Organic headaches are determined, of course, by the disease present. The first and one of the most common of the organic headaches is that due to

Meningitis. The majority of us are well acquainted with the headaches that accompany this most serious disease. We know how terrible it is and how fearful the exacerbations. It may occur in two forms, the acute form, or that form which is present during the acute inflammatory stages of the disease; and second, a headache that is brought about by the changed or thickened condition of the meninges. In acute headache we must at once, and as far as possible, remove all causal agents and any adjacent foci or irritation; absolute quiet with as much tranquillity as possible, together with a darkened room. All nutritious liquid food, without stimulants, constitute the hygienic features; the head should be well raised, and the shoulders likewise elevated; the hair cut close and an ice-bag or coil cap or Leiter's tubes made use of while we are administering such medicinal treatment as is demanded by the case. In the chronic form I have found that medicines seem to be almost or totally without value, with possibly the exception of iodide of potash, and that in this condition relief is to be obtained by the use of hydrotherapy and the electric current.

Tumor. To every one of us has fallen the misfortune of having had to treat a tumor of the brain, and I know of no sadder case or harder condition to conceive of than is presented by these cases; with a pain that is constant, rarely absent, that is so excessive in its severity, in its excruciating paroxysms, we have presented for therapy a very difficult problem. The question resolves itself largely into a diagnosis of the growth, its position, and relief of pain, unless it is a tumor that is superficial and accessible to surgery. It is in this distressing malady that the combination of the neurologist and surgeon have achieved results that are most satisfactory, and productive of such good results that it is always the hope and prayer that the lower and deeper regions of the brain may be made

more easily accessible to the surgeon's knife by those who are compelled to treat and manage such cases. All that we can do is to make the hygiene of the patient as satisfactory as possible, relieve the pain, and treat the causal conditions.

Abscess. In this organic trouble the proverbial "ounce of prevention is worth ten pounds of cure," and to this end it behooves all physicians, where suppuration exists, especially when it is near the skull, to be careful to prevent its spreading to the brain. Where an abscess is forming or has formed, of course the only rational relief of the condition is to evacuate the pus; and here, again, as in tumor, medicine lays aside its hope of benefiting the case, and turns to the master of the trephine and scalpel for assistance and relief. Some good can occasionally be done by rest, application of cold to the head, blisters to the neck, or hot applications.

Traumatic Headache. This form of head-pain occurring after blows, concussion, after laceration of the brain-substance, and after surgical operations is usually very severe and lasts a long time. It need not be circumscribed or limited to a region corresponding to the site of the injury, but in my experience it has rather tended to be diffuse than circumscribed. Prominently associated with the headache are vertigo, lassitude, and indisposition to mental effort. After a little while the head structures seem to take on a sensitive state and become appreciative of very slight causes that are provocative of pain. Of all *organic* headaches that I have had to treat, this form has yielded the best results; the galvanic current applied daily from the head to the epigastrium, or from the seat of the injury to the nape of the neck, in doses of from five to twenty-five ma., for from five to fifteen minutes, is the method that I generally employ, and alternate its application with the use of static electricity and jet douches to the spine and nape of the neck in the manner to be hereafter described.

Arterial Sclerosis. These headaches, when occurring in the early stages of the disease, can be, as a rule, very materially benefited and influenced by the application of non-medicinal remedies. These headaches, produced by changes in the walls of the small vessels (endarteritis), are likewise influenced by a soluble and diffusible poison circulating through the structures that are aching; later the headaches are accentuated by the gradual closure of the small vessels. To those of us who have had to treat this trouble it is hardly necessary to call attention to the accentuation of the second heart-sound, the tortuous arteries, the hypochondria, the depression and emotional state so common with these

cases. It has always seemed to me that in these headaches there are more features than one acting; toxines circulating in the blood, and consequent anemia due to a closure of the lumen of the vessels supplying blood to the acting structures. The origin, of course, of the state must be carefully sought for, and whether it be gout, lead, specific disease, or renal mischief, this must at once receive our attention, but we can materially affect the state of the arteries by giving very careful instructions to the patient. In no class of cases that I can recall is it of greater importance to prevent every thing that borders on excess at the table; the meals should be very simple, with milk as the principal basis, and if it is necessary, perfect digestion may be obtained by the use of digestants; gentle muscular effort must be insisted upon, and where we find patients complaining of lassitude and heaviness, we should either insist upon gentle exercise every day, or what is far better, the use of mechanical vibration or mechanical massage in the manner and after the method to be hereafter described. Occurring, as this does, from early middle to later life, it is unquestionably the sign—the finger-board, as it were—to the lessening of arduous labor, whether that be physical or mental; the seeking out of states of quiet, with moderate physical effort, moderate mental life, and a regular, simple, unexciting daily life. (I have found that the continuous administration of iodide of potash in small doses of from five to ten grains three times a day in from a half to one pint of water, continued for months and even several years, has been of signal benefit to my patients; and I have not seen the depression that is generally supposed to arise from continuous administration of this drug. Combined with Fowler's solution of arsenic and nux vomica we have medicinal remedies that are unquestioned and of satisfactory benefit to these cases when used in conjunction with massage and hydrotherapy.)

Turning from this somewhat gloomy and depressing side of the picture, we can take up the subject of *Functional Headache* with a feeling of satisfaction in the hopes that therapy holds out. Headache is really one of the commonest of ailments to which the American of to-day is subject, and it spares neither man, woman, nor child, but occurs in twice as great frequency in the female as in the male sex. Probably owing to the high pressure under which the urbanite lives, together with the fact that he is closely confined in illy lighted and poorly ventilated rooms, we find that he suffers much more frequently than the suburbanite who tills the soil and lives in a freer and purer atmosphere. The duration of headaches is as variable as the winds themselves, ranging from a few hours to

many years. There are very few individuals that escape headache during their lifetime, many of whom only suffer when bilious or when the alimentary canal has become clogged and inactive. The pain may be continuous or paroxysmal. The pain of headache is nearly always diffuse, and is generally described as being deep-seated; the pain is probably caused by irritations located or referred to the peripheral ends of the V or XII nerve, whose terminations are found in the dura mater.

Functional headaches are symptomatic and indicative of potent and active phenomena in the general nutrition, the result of which is pain referred to the nerve terminations above mentioned. Diagnosis must be very carefully and cautiously made, and to this end every facility in diagnosis should be called into play. It is here that the laboratory frequently yields to us the secret of the pain; much information as to cause can be gained by the thorough and careful analysis of the blood for its hemoglobin, its corpuscular richness, and by examination with the method of Ehrlich. A careful quantitative and qualitative examination of the stomach contents after a test-meal will well repay one seeking for causal features, while collaterally and actually much information can be gained from a thorough examination of the urine, both chemically and microscopically. It is well worth our while to stop a moment and study the question as to the mechanism by which the pain is produced. I would enumerate the following:

1. Derangements of pressure, largely circulatory.
2. Derangements of tension, largely circulatory.
3. Toxic states, maintained by the blood loaded with toxic material brought to the brain, this being one of the most common of the means by which pain is produced.
4. General inflammatory states (the exanthemata), the poisons of which are brought to the brain and cause pain.
5. Reflex, brought about through long strain or irritation, resulting in a neural breakdown.

It will thus be seen that it is largely through the blood-vascular system that we have to look for the changes that are productive of this disorder, and it is probable that the excellent results achieved by the use of non-medicinal remedies has been due to the fact that they act so largely through this system, and favor elimination, purification, and reconstruction of the vital circulating fluid. These poisons circulating in the blood, elaborated during the growth of pathogenic micro-organisms, many of which we are unacquainted with, or they may be that group of toxic products developed

in the many and multiple changes that occur during the chemism of tissue metabolism, the result of imperfect retrograde changes, not eliminated, but retained through imperfect excretion. These cases usually refuse to yield to symptomatic or medicinal treatment, but yield brilliant results to mechanical methods. Sometimes the mere removal of the cause of a headache is far from sufficient, although we are taught by the authorities that the removal of the cause is all that is necessary to produce a satisfactory cure of the case. It is beautiful in theory, but far from the facts of practice. He who is gifted with the ability to discern and remove the causal features has found to his sorrow that it does not remove the pain, for it seems that certain "habits of pain" become established as points of least resistance, that are easily upset by any slight cause or causes acting upon these structures; so I would say that in laying down the general routine of treatment of all functional headaches, we should proceed as follows:

First, by a careful, painstaking examination and analysis arrive, if possible, at the causal features, which we will proceed, of course, to treat. We should then remove any and all burdens that might, through their transferred or reflex action, increase or accentuate the local symptoms, such burdens being prominently found in the eye, the gastro-intestinal tract, the uterus, etc. We should then regulate the hygienic surroundings of the patient, attending with especial care to the cloaca maxima; then remove such toxic problems as tobacco, alcohol, coffee, or tea; regulate work; prevent overwork; enjoin a proper dietary, sufficient exercise, and, as far as possible, such mental treatment as will tend to prevent constant recollection of the pain from which these cases suffer. Having done this, we should next apply the mechanical methods best suited for the particular case in hand. In their application I would say that mechanical methods are suitable for all cases of functional headache, and that in laying down the principles underlying the application of electricity, massage, and hydrotherapy, these principles should be the guiding star, changed and modified to fit particular causal conditions, and used in connection with general hygiene and such well-known medicinal remedies as have been shown to be useful in these cases.

Treatment. From what has gone before it is very evident that treatment along non-medicinal lines would largely depend upon two factors: First, the causal indications existing in a case, and second, the general nutritional state of the patient. The causal treatment can in some instances be very materially benefited by the removal or improvement of

any existing conditions that might add directly as a cause, or possibly as an added weight to the general painful state.

It is usually my plan in treating headaches to first carefully remove any trouble arising from the eye, ear, nose, or throat by having the case carefully examined by a specialist in this department and correcting whatever defect may possibly exist. My experience has been that in the true ocular headache much benefit is thus obtained, but in headaches of complicated or mixed origin the correction of the special organs before mentioned will not be sufficient. Where once there has existed a headache for a certain length of time, it is almost impossible to obtain relief by the correction of the reflex defect, owing to the fact that the structures have, through continued pain, become supersensitive. But it is equally important that the reflex cause or causes should be removed, and, in fact, all causes that produce particular kinds of headaches or that tend in a general way to cause pain. To this end we correct the general life of the patient, insisting upon careful, regulated exercise, preferably in the fresh air; upon the proper ventilation of the room, and upon such general hygienic laws as are well known and established. Of especial importance is the correction or limitation of the use of coffee, tea, alcohol, and tobacco. In all symptomatic conditions the physician must be the judge as to whether any or each of these toxic substances are best totally abated, or whether they should be allowed in moderation at certain times. Where one has been a continual coffee or tea drinker, and unless they present peculiarly sensitive nervous systems, these persons we can allow to take a single cup of tea or coffee, preferably in the morning. Alcohol is never beneficial to headaches as an agent for their cure or relief, and in my opinion is best left entirely out of the question. The same remarks would apply to the use of tobacco, and where we find tobacco users, either men or women, and I am sorry to say the latter class are constantly increasing, we must completely interdict its use or restrict it within very moderate bounds. One can not insist too much or too frequently upon the necessity and use of a fairly liberal diet in these cases unless the headache be directly of gastric origin, in which case the dietary must be based and regulated upon the stomach analysis; when this, however, has shown a sufficiently rich juice to warrant a fair or liberal amount of food, we should insist upon the patient taking this quantity, so, as far as possible, to bring up his nutrition to the top notch. Another point must be borne in mind, especially with regard to the diet, and that is this, that a diet suitable

for a patient taking non-medicinal treatment is not a diet suitable for patients depending entirely upon medicinal and hygienic measures. There are few patients who are undergoing a thorough and radical course of mechanical methods that can not eat freely, and with a certain amount of impunity, a diet that would be completely destructive under other circumstances. The careful and persistent regulation of the cloaca maxima is a rule certainly applicable to these cases, and one that becomes doubly important where toxic states are involved. The non-medicinal remedies, as a rule, have yielded to me results far beyond and much superior to medicinal treatment. This statement is made after a very careful consideration of cases, and after a decade of constant and intimate acquaintance with both classes of remedies.

It has always seemed to me that there is a reasonable and rational explanation of why these methods should be superior to any that we can employ. Referring to the earlier part of this article, it will be recalled that headaches are largely produced through the instrumentality of the blood circulation, and agents that can control the activity of the circulation, can favor elimination and produce the wonderful changes in metabolism that these remedies provoke, are agents for vast good and for the production of permanency of results. No class of remedies that I am aware of so thoroughly and perfectly fulfill the conditions required as these, and for that reason the writer has for a number of years depended largely upon their action for the relief of head-pains, and a constantly growing experience only serves to deepen the opinion here expressed.

Hydrotherapy. Standing at the head and towering above all the non-medicinal remedies, stands this flexible agent that has for centuries upon centuries yielded results so marvelous that, to one who uses it, it seems strange that the knowledge of its use and the frequency of the resort to its power is so little known or so little profited in by the regular practitioners of medicine. Too frequently these cases present all the appearance of a needed stimulation to the blood-current; the application of stimulating hydrotherapy is of great service in these cases, and we have, as a rule, resort to the dripping sheet, the general pack, the rain bath, jet douche, hot air, and electric-light bath. The favorite method of application in institutions where these methods are used, is to place the patient in a hot air or electric-light bath until the heat has gathered upon the surface or until free and full diaphoresis is produced, following this by the use of some active procedure, such as the rain-bath or circular or jet douche. The result of the application of such a

treatment is to draw the blood from the visceral organs, where it has, to a certain extent, been stagnating, and bringing it to the surface; here especially, during the application of warmth, the secretion of the sweat is favored and stimulated. Immediately upon the application to the periphery of cold water we have, by its direct action and reflex effects upon the blood-vessels in the skin and upon the cutaneous nerves and contraction, produced a result which drives the blood again to the center, carrying the already somewhat purified blood and raising arterial tension; when reaction sets in, and this should be always sought and obtained, the blood again goes to the periphery, but is contained in blood-vessels whose tone is good and not relaxed, as in the case of the hot application, and thus a tonic and normal circulation is obtained which would otherwise be impossible. The systemic effects are extensive, far reaching, and satisfactory, nearly all the secretions and excretions are much stimulated, and especially is this true of the excretions; its influence upon tissue change is one of the most remarkable within the range of therapeutics, as it cleanses and reconstructs at one and the same time. In depraved general states, where functional activity of organs has been threatened and crippled, these treatments give them, as it were, a "physiological lift," and they are enabled through this lightening of the burden to resume their former and proper action, with the result that a permanent improvement and a more healthy state is developed. He to whom the action of hydrotherapy is a sealed book should remember the dictum of Erb, "that no nervous disease should be considered incurable until hydrotherapy had been tried." The nervous system is much more apt to be valuably impressed by this treatment and greatly influenced, owing to the manifold reflex effects that arise through thermic irritation. Where headaches arise through states or causes in which overwork, overstimulation, feeble elimination, retention of waste and irritating products, or where there is a combination of these conditions, then it is that we find this agent more nearly a panacea than any I know of, and thus it is that the neurotic American man or woman, with his manifold headaches, finds in hydrotherapy a new "Pool of Bethesda," from which he may descend and take up his bed and walk.

It is exceedingly difficult within the confines of such an article as this to compass even more than a few thoughts concerning an agent about which books might and have been written; suffice it to say, however, that to the writer it has proved his right-hand ally.

Electricity. Everywhere in the ranks of science there remain a

number who will always doubt, and to whom skepticism is not only a pleasure but a luxury, in which they indulge constantly and upon all occasions. Probably nowhere in the range of therapeutics has this skepticism existed in greater degree than with regard to electricity, but I think to-day in the minds of intelligent persons, lay and medical, this skepticism is giving way to a rational appreciation of its true value. That currents of electricity possess power and produce physiological results upon living tissue is well established and accepted to-day, but I think nowhere is it better appreciated than in that type of stimulating the nervous system, in producing what we call "tone." This tonic action is best exhibited in the general results rather than in the specific action upon muscular fiber or superficial structures. The production of vital changes in tissues is such as to produce changes of a chemic, circulatory, stimulating, and sedative kind. In these cases, in which there is a great depression of vitality and which are characterized by painful states, we find in the various currents valuable agents in the production of those changes that are necessary and essential for the relief of headache. Electricity, like hydrotherapy, increases secretions, favors excretions, and produces changes in the tissues that may continue for months after its discontinuance. To-day the medical profession is paying a great deal of attention to the use of electricity, and in this symptomatic trouble we find them daily using it more and more. Of all the currents that are most useful in my hands in the treatment of headaches, the *Galvanic* has yielded the best results. I generally apply it in the following manner: A large electrode six by eight inches is applied to the epigastrium and connected with the negative pole; the positive pole in the shape of a three-inch round electrode is then applied to the vortex of the cranium after the head has been well dampened with water. The current from two to twenty ma. is then allowed to flow for from two to five minutes, the current being regulated and controlled by the rheostat; an application is then made of one or two minutes to the cervical, sympathetic, and pneumogastric nerves on either side, using from two to five ma., and the application is finished by an application to the nape of the neck or to the spine of a current ranging from five to twenty ma. for five minutes. Each time that the change is made the current is carefully turned off, and then again turned on; by this means all shock or irritation is prevented.

As I have said before, this treatment has yielded me excellent results, although I have varied it or modified it in a number of ways; for example,

where the pain is frontal the application to this region should certainly be superadded to the treatment before outlined, and this holds good with regard to regional pain. All those who have used this current much know its sedative influence upon headaches.

The next form of current that I prefer is the *Static*, and this form should be applied especially in large volume. The machine itself should be a powerful one, and contain from six to eight plates ranging from twenty-six to thirty-six inches in diameter. Personally I prefer that made by Waite & Bartlett. A few practical points in the arrangement of the machine gives better results, especially when it is run at a regular rate of speed by an electric motor, the current is one of high potential and great frequency, its discharges being oscillatory in character ; its electromotive force is enormous and estimated at thousands of volts. I am accustomed to use it in these cases by applying the sparks from the large brass ball in the following manner : They are first applied freely to the entire spine from the occiput to the sacral region ; sparks are then applied *ad seriatim* to the liver, spleen, epigastrium, and pelvic regions. This is followed by the use of insulation or the static breeze. We can sometimes accentuate the effects of stimulating applications by concentrating the current by means of the brass point upon the painful spot in the head.

Treatment has been of especial benefit in those cases that have been of a congestive nature, although it relieves headache in an astonishing manner. That it possesses general effects of a nutritive and stimulating power over depressed nervous states is not as generally realized as it should be. That it influences and overcomes the tendency to insomnia in these cases is another one of the reasons why benefit arises. I do not and can not believe that its effects are produced through suggestion.

The *Faradic* current has not been of very signal use to me in this trouble, but can be used to advantage in overcoming some forms of head-pain that are superficial. The results of electrical treatment are, as a rule, very satisfactory and usually permanent. It can be safely stated, as an every-day observation, that it increases, diminishes, or modifies physiological or pathological processes. The application of these currents increases the appetite and digestion, equalizes the circulation, favors assimilation, improves secretion, hastens excretion, quiets nerve irritation, affects metabolic processes in a satisfactory and positive manner ; in all functional states it has a selective action. Where there are general effects to be obtained, we must make the applications generally, with such local modifications as meet the individual pain ; in many instances I believe it

possesses the ability to enhance and improve the action of medicinal agents.

Of all the remedies of this character, the least valuable and the least important is *Massage*, and the only value it possesses is the general influence it has upon nutrition. It should be utilized in all those cases where depravity of the general state is present, and it is in this field that massage and mechanical vibration do their maximum good. Again, we find that the reason for improvement following the use of this agent is that the results are obtained through its influence upon nutritional changes, and we find that it has a general and beneficial effect upon nutrition, elimination, reconstruction of tissue, and the revivifying of nerve tone. Through its action upon the circulation and as an agent for reflex effects we find that the circulation is equalized and improved by its excitation of the abdominal organs, changes are brought about in which elimination is more rapid and the intestinal juices richer and more active. The application of massage to the head sometimes relieves the pain, but the main value it possesses is through its action upon the general system at large. In the management of a case of persistent functional headache, a time will be reached when certain non-medicinal remedies, and parenthetically I may add medicinal, seem to lose their value or ability to do the maximum good, and then another should be substituted, or what is frequently of benefit, the combination of one or more treatments; thus, for instance, the alternate use of hydrotherapy and galvanism, or the combination of massage and electricity.

As a rule the neurologist never sees a case of headache until it has been chronically fixed and the patient has "tried" a number of physicians and a multitude of remedies, adopting them in a hit or miss fashion, or "in hopes of its doing him good;" it is always well to remind such cases that chronic headaches require more or less chronic treatment. Simple remedies may sometimes, during an acute exacerbation of headache, prove of some value; for example, the application of an ice bag to the nape of the neck or over the entire length of the spine will sometimes relieve the intense attack of pain. Some patients get a certain amount of relief of headache by the application of sinapisms, and to this end employ the little mustard leaves now a part of every druggist's stock. Others resort to the menthol pencil or to the application of excessively hot compresses, but all of these applications are temporary and evanescent in their action, and can not be considered as essentially a part of the treatment.

TREATMENT OF TYPHOID FEVER.

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The domain of medicine, though infinitely beyond the grasp of man's mind, is divided into two great subjects, physiology and pathology. When nature puts into existence a being she attains to but one end, and that is to maintain physiology.

Disease may hinder or even arrest this law, but the struggle is kept up until restoration or death. As we are co-workers with nature, we must have physiology as our guide or the result will be a failure. The physician, then, who prescribes without this particular end in view is a menace to suffering humanity. His intentions may be good, but the physiological actions of pills and capsules will not be changed to cover his mistakes. Any disease that has a duration of two or three weeks tests the skill of the physician. The patient has but one stomach, and upon this organ falls the duty of absorbing medicine, liquids, and digesting the food necessary for the nourishment of the patient.

Every organ in the body suffers from the effects of toxines from typhoid fever. The mind and the muscles can rest, but the stomach and heart must work or the struggle soon ceases. These are the two sentinels upon which depends the safety of the patient. They must be congratulated if they have a physician who walks hand in hand with them through the struggle, but they are to be pitied if he tramples them under in his efforts to cure typhoid fever.

The treatment of any disease does not consist merely in getting a patient out of bed and discharging the case; this is only the foundation to the building, so to speak. There is more honor in keeping a man out of a fire than there is in dragging his charred remains from the flames. He is out of the fire, it is true, but he is not of much service to his family afterward. Nature, with the fixed laws, is the attorney for the patient, and we are the judge to sit upon the case and allow no advantage to be taken by the ever alert bacteria that inhabit the body and are constantly waiting for an opportunity to attack and devour a lowered vitality.

There is one rule to guide us in the treatment of disease—"treat the patient and not the disease." Keep in touch with nature, and have a

scientific reason for every thing you do and say; treat the case as nature treats it, and you will be nature's assistant.

The constant irritation of the delicate mucous membrane of the stomach by medicine for two or three weeks may change a once healthy stomach into a diseased one that may end the patient's life. Injudicious feeding may cause intestinal catarrh, from which the patient may never recover. The responsibility of the physician in prolonged diseases is far greater than he realizes; it is no honor to make a "catch-all" out of a healthy stomach and bowels during typhoid fever, and make a physical wreck out of what was once a perfect type of physical manhood. This has been done in many cases. It is lucky for the doctors that the laws of God and man apply only to willful murder and maiming.

When we look over our record and see the number of lingering cases of typhoid fever, we may safely say that 90 per cent of these cases could have been different if we had treated the cases skillfully. We may nurse and feed the patient faultlessly, loving hands may smooth the pillow and make the bed easier, anxious friends may kindly remember, but one irritating and useless drug may defeat our plans and wreck the progress of the case. Then whose is the fault? It is not the drug, for pills and bullets are blind, and wound friend and foe alike. You can claim the fault as your own. We must reason from cause to effect, and from effect to cause. Meet every indication with its corresponding remedy, and give medicine for its effect. Routine feeding and prescribing is vicious practice; a drug that is indicated in the father may kill the son, though they lie side by side with the same disease. The sum total, then, is know your patient, or he will be unrecognized by his friends if you do not give up the case.

As typhoid fever is a septic disease, we must favor elimination and assimilation. No army can win a battle without ammunition. Toxines must pass out as rapidly as they are absorbed; the system has enough to do to eliminate the toxines from the fever alone, without the extra labor of eliminating undigested food and useless drugs. The functions of the stomach are threefold — digesting, absorbing, and germicidal. The three work in harmony, and to impair one impairs the other two; keep in perfect harmony with the trinity. To interfere, then, for a day with the functions of the stomach places your patient in an extra hazardous position.

We frown upon the surgeon who tries to cleanse his wound and at the same time dresses it with a foul dressing, or one that favors the growth

of the infecting germ, but we pat the doctor on the back and label him a hero who feeds and stimulates the patient every three hours for six weeks or two months, and finally lets him get up in spite of his efforts to the contrary. He heaves a sigh of relief, and jests about how he pulled Mr. B. through such a severe case of typhoid fever.

The bacilli of Eberth are selfish enough to claim all the praise, and they do not mention it that the doctor was responsible for the extra sickness after they finished their contract with the patient. When called to see a patient with typhoid fever, open the journal and examine his liabilities and assets. Is the patient older than his age? If so, why? Is his pulse excited, weak, or strong? If so, why? Is he nauseated, full of aches and pains? If so, why? Is there gurgling in the right iliac fossa, and is his tongue foul? If so, why?

If there are these symptoms, be sure that you can wash your hands clean of their cause. There is no necessity for foul tongues, delirium, sick stomach, pains, headache, insomnia, high temperature, weak pulse in typhoid fever. If we will practice physiology instead of medicine, we will avoid these.

When you get a fever patient in bed, give him a rest; I mean a rest from the crown of his head to the soles of his feet. There will be a drain on the system—a disturbance of the equilibrium between assimilation and waste. The patient lives on himself to a certain degree; then he must minimize waste in every organ. The patient's mind must not be upon his business; if he has been irregular in his habits, we must at once establish a regularity; in fact, we must, as nearly as possible, reorganize his organic harmony and let each organ do its work.

Let us divide our cases into two classes: First, those who are healthy prior to the acute disease; second, those who have had some chronic disease for years. In the first cases we have an opportunity to show our skill or to put the patient into the second class for the next case of fever. Case "A" is in the first class; he is a perfect type of physical manhood; he has been complaining for a few days, and has called at the doctor's office several times for medicine. He was given calomel for biliousness and quinine for malaria. His already inflamed bowel is irritated by the calomel, and his liver wonders why it is dosed and stirred up for a trouble that is ten or fifteen feet down the alimentary canal, and over which it has no control. He grows worse, and, after a chill, a restless night with aches and pains, he sends for the doctor. His liver, irritated by the calomel, has poured out a lot of bile, and the patient has been vomiting

it into the slop-jar for several hours. The sight of so much "bile on the stomach" proves to the doctor that he is very bilious and must have more calomel. (He fails to realize that the slop-jar is more bilious than his patient.) The calomel is repeated, and so are the deleterious effects of the drug.

Now, keep in harmony with the trinity. The patient has been taking medicine irritating to his stomach, and has been eating indiscriminately since the first symptoms of his trouble, and the chill, high fever, and headache tell us of the fact. If the physician recognizes typhoid fever at once, he informs the nurse that he must begin to nourish and stimulate the patient to tide him over a long and dangerous illness. He directs the patient to take a glass of milk or bowl of soup every three hours, and if his pulse is a little accelerated from the toxemia, he mistakes this for an indication for stimulants, and directs him to take a tablespoonful of whisky every three hours until his return. How many of us have been guilty of this mistake? A link in the trinity has already been broken, and we make the separation greater and perhaps permanent by overfeeding and stimulants.

A healthy stomach has enough to do to digest three meals a day, but when the stomach of Case "A" takes typhoid fever, it needs a rest for the long task it has before it. You cause it to work constantly by giving food every three hours. This is kept up for a week, until he begins to vomit; you have been pouring antiseptics and septics down him day and night, disturbing his sleep to give him food, so that if he dies the family and you can say that every thing was done for him that could be done. This is true in one sense of the word. No wonder it takes him weeks and months to recover; the doctor and disease make a combination disastrous to any patient. His temperature is running to a hundred and four or five degrees; his expression is dull; he is delirious, sordes are upon his teeth; he sleeps with coma vigil; his pulse is weak, there is diarrhea, there is gurgling in the right iliac fossa. We have now got our patient into the great state called the "typhoid state," a state that we ought to be ashamed of. Each glass of milk gives impetus to the trouble; it passes into the bowels undigested, and the patient poisons himself hourly.

Now about the whisky you have been giving. Here is another fatal mistake. Why? Because the pulse, laboring under the poison, is accelerated, and you mistake this for weakness or an indication for stimulation. The heart needs a rest instead of stimulants; stimulation causes

overwork and exhaustion at the time when good circulation is most needed. Let the heart alone; it knows it own business better than we do. It is useless and disastrous to stimulate a weak heart-muscle.

Now for the treatment of Case "A." The best rule is, if you do not know what to give, do not give any thing; guess-work in medicine is bad practice.

There already exists an inflammation in the bowels, and it is unsurgical to cause severe peristalsis by giving purgatives. Calomel is then unsurgical. If the patient is nauseated I withdraw all food until his stomach is in condition to digest it; then I feed him three times a day, and give him such food as he can digest perfectly.

If the patient is not hungry at meal time I direct him to wait until he has an appetite. If the stomach is taken care of, this waiting will not occur very often. His food consists of beef tea, beefsteak scraped into a pulp and heated gently, crackers rolled fine, eggs, either raw or cooked, and soups in small quantities and highly nutritious. Never allow your patient to eat any thing that he is required to masticate, but always prepare food so it needs only to be mixed with the saliva; thus his stomach will digest perfectly the food, and the patient will be nourished and the germs starved, and his stomach will get the needed rest. There will be no self-poisoning from decomposed food that has passed out of his stomach. Orange or lemon juice will be grateful to the patient and will do no harm. When the temperature runs over 100 degrees I use as an antipyretic antifebrine or a tepid bath for twenty or thirty minutes; about three doses during the day and one at bedtime will keep the temperature down, and will make the patient more comfortable.

I prefer the bath where it can be given. The patient is bathed two or three times a day with tepid water for about thirty minutes, and the temperature will fall. If the patient is a little restless at night I give him a sedative. Bromidia acts nicely and leaves no bad effect. As a rule patients will rest well after a few nights if the nurse will not disturb them every few hours during the night to give medicine and food. This is a point that I wish to emphasize. Avoid disturbing a patient during his sleep. Rest is essential to health, and of course the patient needs it. Let him sleep until he awakes of his own accord. If the tongue is dry it shows a morbid condition about the stomach and must be watched with care. I let the patient drink all the water his stomach will absorb.

It is next to impossible to give antiseptics enough to render sterile the alimentary canal; then, too, most antiseptics are gastric irritants, and

their continued use is dangerous. If there is much decomposition I use small doses of some sal. cathartic until the canal is cleansed, and then I use tincture iodine and carbolic acid or duotal in small doses until their effects are contra-indicated. Keep the mouth clean, and let the patient chew tolu for a few minutes during the day. In my efforts to guard the stomach I do not forget the colon and rectum. I irrigate the colon three times a day with warm water, and if there is a catarrh I use with the water concentrated extract pinus canadensis, and then at night inject into the sigmoid flexure Dr. J. M. Mathews' prescription of almond oil, bismuth, and iodoform. This will relieve the catarrh and prevent the lower bowels from absorbing the putrefactive material, and thus help to relieve the system of what plays an important part in the rôle of typhoid state.

If water is not taken in sufficient quantities by the stomach, I inject about a quart into the colon and leave it for absorption.

Case "B." This class, of course, gives us much trouble, because we begin the struggle at a disadvantage, but we have an opportunity to use the same care and judgment as in Case "A." Most chronic diseases are in the lungs, kidneys, heart, or alimentary canal. I have had consumptives pass through typhoid fever as easily as robust patients, but dyspeptics are a source of worry to the physician. We must watch digestion with especial care. If there is myasthenia with fermentation, we must give a small amount of food easily digested and slow to ferment. The white of an egg given raw with pepsin and hydrochloric acid suits this class of patients. It is digested and leaves the stomach in about an hour and a half, and this gives the weak stomach the much-needed rest.

Do not give milk to a patient with catarrh or myasthenia. Milk given to a patient every three or four hours will kill more patients than the fever. Treat the stomach and feed it just as you would if the diseased stomach was the only trouble the patient had. The colon is irrigated and the baths are used as detailed in Case "A."

In order to prove my position about no stimulants and feeding only three times a day as being not so disastrous to my cases as you may claim, I will give a brief statement of two typical cases of "A" and "B," which were treated as above described.

Case "A." Male, married, age twenty-four. Previous health good. First visit October 8th; temperature 102° F.; pulse 90; he had been sick four days; he was nauseated and restless; food was kept away for twelve hours. On the fourth day his temperature was 102° F.; pulse 76. October 14th, temperature 100° F.; pulse 80. October 31st, temperature

99° F.; pulse 80. There was not a single stimulant given, and his temperature and pulse were at no time during his illness as high as on the first day, being 102° F. and 90, respectively. He made a perfect recovery.

Case "B." Female, age twenty-four; had been nursing child for six months; she was very pale and anemic, and had been too weak to do her housework. I saw her on August 7th; she had been sick four days with diarrhea and chills and general malaria; her temperature was 103° F.; pulse 100; her diarrhea was painful, and was due to colitis; her digestion was poor, and no appetite. I used injections as above described, and fed her as her stomach could take food. On August 13th her temperature was 101° F., pulse 100; her colitis had checked, and she was gaining in strength. I gave her syr. albumen iron co. at the beginning. Her facial expression had grown bright; her tongue was clearing up; her appetite was good. August 23d, temperature 100.5° F.; pulse 116. August 27th, temperature 98.5° F., and pulse 106. She was not fed but three times a day, and she was not stimulated at all. I am glad to say she did not starve to death, neither did her heart give up the fight for lack of stimulants. I gave her an opportunity to get well, and she took advantage of it.

In the treatment of your cases let your motto be, "Remember the stomach first, the colon next."

TUBERCULAR PERITONITIS.

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Literature on tubercular peritonitis is very meager. In 1862 the first case was recorded. Sir Spencer Wells opened the abdomen under mistaken diagnosis and found tubercular peritonitis; simply closed the incision with a recovery. This seemed to be a starting-point for operative procedure for this condition. In a few years the operation grew still more popular. Konig in 1884 recommended laparotomy in all cases. This affection of the peritoneum is especially interesting to the surgeon; first, because of the difficult diagnosis; second, probably because of the many sources of infection. The most frequent source of infection in

children is probably through the mesenteric glands; in women who have menstruated and borne children the infection frequently is through the genital tract. The primary lesion is situated most frequently in the intestine; according to Phillips in 74 per cent, and according to Sick in 65 per cent. Next frequently it is found in the female genitals, in 26 per cent, according to Sick. The liver and spleen are often secondarily involved by extension of the disease along the fibrous tissue of the stroma. Many cases are reported to have been secondary to tubercular pleurisy, but I have never seen a case following pleurisy. Tubercular peritonitis is not a common sequence of phthisis pulmonalis, though in the late stages, when the tubercular infection is so general, we have infection occurring through the bowel from the mucous to the serous surfaces. These cases are seldom seen by the surgeon, as it is too late to offer any hope at all by surgical interference. Many of the cases occur in robust, healthy-looking subjects; those who have not been ill, or have not shown any evidence of chronic disease. Kelly gives a list of cases in which there were 80 per cent that presented a good general appearance, that is, good flesh color, with 20 per cent poorly nourished, anemic and sickly.

Tubercular invasion of the peritoneum is claimed by many to be always a secondary infection, but I am sure, in a great many cases, there can be no proof of tubercle bacilli in any other organ of the body. In a great many of these cases there seems to be an immunity given by this invasion against other tubercular infections. There may have been a latent focus that has become active, thus causing the rise of fever and the general infection, producing all the classical symptoms. It is generally conceded that tubercle bacilli may lay dormant for a long time, though I can not understand or explain how it is so, for we know that the life of tubercle bacilli is short when exposed. Tubercle bacilli can not always be found in these early ascitic cases, or even in the early stages of adhesive or fibrous cases. The extreme age seems to be exempt to some degree. The age at which most of these cases occur is between twenty and thirty years. I think there is no doubt but that the female is very much more likely to be the subject of this condition than the male, although some former statistics of autopsies place the male far ahead. A very much larger per cent of females have been subjected to operation. Whether or not the larger number occurring have been in the female it is impossible to say, for women are much more likely to submit to operation than men, and we might not see as many cases in

the male, because they refused operation and went on to recovery, and a positive diagnosis was not made, or that they died, thus adding to the number credited to the male mortality list. Since laparotomy is being done continually for diagnosis, tubercular peritonitis has been found to exist very much more frequently than was formerly thought. It is frequently found to exist in conjunction with some other abdominal disease, and had not produced sufficient symptoms to have caused a diagnosis of this condition, or to have even been suspected.

Diagnosis is difficult in a great many cases, and when the onset is sudden and attended with great pain it may be mistaken for appendicitis, hepatic colic, or renal colic; when the onset is insidious and attended with general debility, fever, and abdominal swelling it has been taken for tubo-ovarian abscess, or even ovarian cystoma. With the slow approach, attended with fever, malaise, and abdominal tenderness and flatulency, it is hard to differentiate between tubercular peritonitis and typhoid fever. Sometimes the diagnosis can be made by microscopical examination of the curettage of the womb; that is, with a case in point where the diagnosis is doubtful, if tubercle bacilli be found in the curettage, it is very reasonable evidence of the correctness of the diagnosis. Tuberculine is not a positive agent in diagnosis, although it is considered an aid by many.

Diagnosis, as a rule, is made by exclusion. If in doubt and the patient is in fair condition, and there are all the facilities for operation present, exploratory section is justifiable in competent hands, as less than three per cent have died from the operation *per se;* and with well-selected cases there should not be even that large a mortality rate.

The classification of this disease is of no material importance, still the pathological as well as the clinical forms as classified by Adelbert have been generally accepted.

I think there should be some amendments to his classification. He gives the ascitic, the fibrinous, and the ulcerative forms. I think there should be added plastic and caseous. I have seen all these conditions existing in one peritoneal cavity. The ascitic form is the only form likely to exist alone. The other conditions are only stages of one disease. It has not been very many years since it was taught that tubercular peritonitis was always fatal, and only a very few years since the reverse of this has been generally taught.

The treatment is divided into medical measures, aspiration, introduction of air or other substances into the general cavity, and laparotomy.

In my opinion aspiration should not be resorted to unless the cutting operation is refused.

There are some grave cases in which medical and palliative treatment will have to be instituted and carried out. In these cases of palliative treatment, food, tonics, change of air, etc., will have to be the chief reliance. I scarcely deem it necessary here to mention any of the serum or lymph treatments, as there has been no demonstration of enough cases to give any credence to the reports from these agencies. There have been only gratifying reports from one method of treatment, that is, of celiotomy. In the worst cases recorded the operative treatment has furnished very gratifying results, and the more recent reports are the most encouraging ones, and now in this day of so nearly perfect asepsis and technique, reports are bound to be still more flattering.

Ascitic forms are probably the most common, and in some respects the most important, and should always be treated by free incision through the abdominal wall and peritoneum, the incision being large enough to afford careful exploration and to admit of the fluid being entirely sponged out. There should be thorough enough evacuation of the serous contents not to necessitate the use of a drain. Cases that have been drained always have a longer convalescence and a more uneven recovery, the fever recurring at intervals, and the patient compelled to remain in the hospital longer. There are many disadvantages attending the use of a drain, some of which are a chance of infecting the tract of drainage or establishing a fistula. Operation in the ascitic form is generally a simple one, there seldom being any complications ; but the plastic, caseous, and the suppurative add much more to the possibility of a hard and tedious operation, to say nothing of the added risk and more unfavorable prognosis. Still, with the subject in a fair general condition, the prognosis is far more favorable than medical or palliative treatment could offer. In the simple plastic cases it is advisable to separate all the adhesions, especially the band-like ones, causing a possibility of obstruction.

There is, however, a condition sometimes found in these adhesive cases where conservatism is wise ; that is, where the whole abdominal contents seem to be one solid mass, it even being very difficult to find a small point of cleavage. These cases are often found to have caseous nodes under this fibrous capping, and even to have suppurative processes that are still encapsulated. The breaking up of these adhesions causes considerable hemorrhage, delay to the operation, thus causing additional shock and further infection with death speedily following. This probably

is the only inoperable condition when the disease is confined to the peritoneal cavity.

In these adhesive cases the omentum is dark, and there is a good deal of thickening and some discoloration, and fine seed-like deposits are usually felt and seen all through the peritoneum and omentum thus affected. In such conditions it is usually advisable to remove this omentum if there are any nodules that you suspect of being caseous, as they are apt to break down and suppuration to ensue. It is well to treat these cases with iodoform dust, care being taken not to use too great a quantity, as there has been iodoform poisoning in peritoneal absorption. In the caseous stage the omentum and mesenteric glands are the usual site of the caseous nodules. Curettage of these nodes, followed with a thorough wiping with iodoform gauze, constitutes the general treatment. This condition is more likely to necessitate the use of drainage, the drain either being simple gauze, iodoform gauze, gauze wrapped in rubber tissue, or fenestrated rubber tubing. I do not think it advisable to use gauze in deep drainage unless it is protected by rubber tissue, as there is a likelihood of breaking up adhesions and causing internal hemorrhage. There is also more likelihood of infecting the external wound. In the removal of gauze drainage that is unprotected there is much more pain than in removal of other drains. The question of irrigation might be discussed with any of these conditions, but the ascitic form is seldom drained. In the caseous cases irrigation is more harmful than otherwise. If the surgeon has taken careful pains to protect the toilet of the peritoneum, the chances are that he will not infect the parietal or visceral peritoneum in evacuating the caseous contents, and if irrigation is practiced, it is very difficult indeed to keep from infecting larger areas.

The suppurative form is the last we will consider, and it is the one which gives the poorest results, and the one which demands the most careful management. The suppurative kind is more especially likely to involve the peritoneum of the lower abdomen and pelvis.

Whether this condition, aided by other micro-organisms, is more productive of suppuration or not is hard to say, but it is reasonable to presume that it is so. In tubercular pelvic peritonitis the infection is usually through the ostium of the fallopian tube, and being in such close proximity to the lower bowel that the colon bacilli and other micro-organisms that have their habitat in the bowel lend a helping hand to the suppurative process.

It is a fact that in suppurative processes in any part of the body (that

are called tubercular) we have several other pus-producing organisms present. To deal most effectively with these cases it depends on the points of suppuration and area whether or not irrigation should be used. If there are many points which are remote from each other, there is a great possibility of infecting still larger areas. Irrigation in these cases will have to be left to the judgment of the operator. In localized suppurative points, the healthy peritoneum can be protected by non-absorbent sponges, thus affording complete irrigation of the pathological process. There are many fluids for irrigation, but the normal saline solution used so generally now is probably the one in greater favor. It is not safe to leave these cases without drainage, and either tubal or gauze wrapped in rubber tissue is as near an ideal drain as can be procured.

Parker Syms presents a study of the surgery of tuberculosis of the peritoneum. He says that in the majority of cases of tuberculous peritonitis laparotomy will produce a permanent cure. A variety of theories have been put forth to explain why laparotomy should cure: First, that the cure is due to the use of chemical germicides; second, that it is due to the use of drainage; third, that it is due to the exposure of the abdominal cavity to the sunlight and air; fourth, that the removal of ascitic fluid alters the blood-circulation; fifth, that bacteria may be introduced which do good by producing a toxalbumin fatal to tubercle bacilli; sixth, that the traumatism establishes fibrinous peritonitis, the bacilli becoming encapsulated and their growth being arrested; seventh, that the cure is owing to the advent of multitudes of leukocytes, and hence results from phagocytosis; eighth, that the mere opening of the abdominal cavity brings a physiologic change in the peritoneum which makes it cease to be a proper soil for the growth. Not one of these theories can be demonstrated to be true, and some of them may be discarded. Cure does not depend upon the use of disinfectants, because in a long series of cases cure was obtained when no such agents were employed; in fact, there are more cures reported without the use of such agents than with them. That cure is not brought about by the relief of pressure due to the withdrawal of ascitic fluid and the consequent improvement of the blood-circulation is shown in cases in which tapping does not benefit the patient. That drainage is not the reason of the cure is shown by the fact that patients do better without drainage than with it. The other theories can not be either proved or disproved, but it should be borne in mind, for instance, that a tuberculous joint can not be

cured by exposing its interior to sunlight and air. We are forced to the conclusion which Tait arrived at, that opening the abdomen produces a change in the physiologic character of the peritoneum which makes this membrane able to destroy the tubercle bacillus. Some other theories are as follows :

Linder suggests that the cure is due to the restoration of the absorbing power of the peritoneum, which has been suspended by the inflammation, and is set at work again by the reaction following the operation. Others have claimed that the production of cicatricial adhesions results in a cure, the connective tissue checking the tubercle bacillus in its growth. Still others have asserted that the removal of the serum of the ascitic cases removes the bacilli which it contains and probably large amounts of their toxins also, which would account for the result in those cases, but does not explain the cures in the dry form. Frees has suggested that it is due to the attraction of the blood to the peritoneum by the reaction following the operation, and supposes that the blood of patient with so much tuberculous tissue must contain a large amount of antitoxin (otherwise they could not exist), and that by this additional supply of blood large amounts of the antitoxin are brought to bear upon the tubercle bacilli in the peritoneum.

Adelbert, with 308 cases, and Roersch, 50, making 358 cases with complete analysis, give the following summary :

Of these, 70 per cent (250) are reported as cured ; 53 remain cured for over two years, 79 for one year, and 118 for a half-year ; 34 remain unaccounted for. There were only 20 deaths from the immediate effects of the operation, 10 of which were from septic peritonitis ; 51 cases died in a few months from some tubercular affection.

Frees has reported 18 cases operated on since 1888. The diagnosis of the disease was made from microscopic examination of the nodes. All the cases were of the ascitic form. The immediate mortality was 0 ; 6 of the 18 cases have remained well ; 9 died before the end of the first year.

Frees insists that a diagnosis of tubercular peritonitis should never be made without the microscope. In support of this he cites two cases which proved to be non-tubercular ; one was simple fibrous peritonitis, the other cancer of the peritoneum.

In conclusion, if in doubt, operate ; if your diagnosis is correct, remove all the disease possible, remove all the peritoneal fluid, and relieve any complications that exist. Tubercle of lung is not a contra-indication, as

relief is secured from the tubercular process in the peritoneum, and that assists the general condition, giving the patient a better chance to resist the invasion of the organism in the lungs.

Miss E., aged twenty-seven. Good previous history, with exception of one attack of colic about three years ago, supposed to be intestinal. Milliner. Was taken with a chill at three o'clock of the afternoon of March 5th, with severe pain in right side. I was called at 10:30 the same evening, and found her suffering excruciatingly, so that she cried out every few minutes. Pain started in right hypochondriac region, and extended well up in the right lung and shoulder of the same side. Pulse 130; temperature 103.5° F.; respiration about 50, when in less pain about 40 per minute. She was suffering so intensely that I gave one-fourth grain morphine hypodermatically. That kept her quiet for about four hours. I was called again in the early morning before breakfast. I saw her about 7 o'clock, with temperature 100.5° F.; pulse 120; respiration about 40. No cough. I could not detect any pleurisy; patient had some vomiting, which I took to be from morphia. I ordered hydrarg. chlor. nit. gr. 3, antikamnia gr. 20, nitro-glycerine gr. ⅛, in four capsules, one every hour until all were taken.

In the evening of the 6th she was a little more comfortable, with temperature 100° F. Passed a poor night, but felt less pain next morning. I forgot to state that hot applications were kept up over the liver and right side all the time, night and day. Purgative acted well, and patient had some relief until the evening of the 7th, when she had another chill, with pain all over bowels, worst pain over the large end of stomach. The next day my office mate, Dr. Louis Frank, saw her with me and made a careful examination, but did not make a positive diagnosis, but felt sure that the gall-bladder was the seat of the trouble. There was little change for two days, when I asked Dr. Ap Morgan Vance to see her with me. He also thought it gall-bladder trouble, and advised operation unless symptoms abated in twenty-four hours. Patient was having some distension both over the stomach and bowel. No nausea. Enemata of hot water were given frequently, as that enabled her to get rid of flatus and relieved the pressure from distended bowel. At one time it was thought she passed some pus. About the 18th she began to do real badly, and I decided to operate. On the 21st I opened the abdominal cavity just over the gall-bladder region, and on introducing my finger I found adhesions between the inferior border of the liver and bowel. The adhesions were slight, and I soon found the gall-bladder

to be normal with no stones. On further investigation I found spider-web-like adhesions all over the visceral and parietal peritoneum, being adherent everywhere. They were broken down, and the wound closed and patient put to bed. She recovered rapidly; no fever after the third day, but little pain after second and third day, and was up in two weeks. She has gained flesh, and weighs more now than for several years.

UNUNITED FRACTURES.

J. LIVELY JOHNSON, M. D.
LOUISVILLE.

Ununited fracture is a term employed to designate the condition of a fracture in which bony union has not taken place up to the period normally required for its occurrence.

The causes of non-union are both local and constitutional; the local causes are want of perfect approximation of the fragments, in many instances due to the interposition of muscular tissue.

It is observed that oblique fractures more frequently fail to unite than any other variety. Perfect rest, one of the most important requisites to the union of fracture after reduction, is difficult to obtain, unless the dressings receive from the surgeon the most scrupulous care in their adjustment. The matter of reduction of the fragments and the proper adjustment of dressings can not receive too much attention from the attending surgeon, as upon this largely depends the comfort and welfare of the patient.

We know that the blood-supply plays an important part in the repair of not only the soft parts, but in the bony tissues as well. As a natural consequence in fractures, the blood-supply is very materially diminished, as in the fracture of the neck of the femur or humerus. Again, the blood-supply is interfered with when a nutrient artery is torn, or when a thrombus forms in a vein near the seat of the fracture.

Under the above circumstances the fragments round off, and the medullary canal becomes filled with a deposit of callus, which soon ossifies, forming a false joint. In many instances the fragments are perfectly independent of each other, not being held in apposition by either bony tissue or fibrous bands. These pseudarthroses, which are held in

close proximity by a fibrous capsule, after a time secrete a serous fluid which serves the purpose of lubrication.

The constitutional causes are syphilis, tuberculosis, disease of the bones, old age, scurvy, malignant disease of the bone, rickets, and last, but not least, paralysis and deficient innervation have often proven to be the cause of non-union of fractures.

In some cases the fragments do not unite at the usual time, and even fail after several attempts upon the part of the surgeon to induce repair. Notwithstanding the foregoing facts, by the persistent and repeated efforts of the surgeon perfect union is generally the result.

Dennis reports one thousand cases of compound fracture, all of which recovered under strict asepsis without a single case of non-union. He further states that about one fracture in every ten is compound, thus allowing the consideration of ten thousand cases without a single non-union. Thus you observe from Dennis' statistics that ununited fracture is of somewhat infrequent occurrence; nevertheless, it is encountered sufficiently often to at least compel us to be so familiar with the nature and treatment of this class of fractures that we need at no time hesitate to express our unbiased opinion as regards the final destiny of the case.

In a few cases, where the fragments are accurately approximated, primary union, from some cause, fails to take place; this, too, may be the result after several attempts in the way of operative procedure to procure repair, although union can eventually be secured, but in some instances it has only come after half a dozen or more operations.

The femur and the humerus are the most frequent seats of ununited fracture; next the bones of the leg, and, lastly, the bones of the forearm. It is readily observed that that portion of the bone away from the direction of the nutrient artery is the fragment which gives rise to non-union because of its diminished nutrition.

In the upper limb the nutrient artery runs toward the central joint, while in the lower extremities the nutrient arteries run away from the central joint. We naturally observe from this anatomical law that the upper part of the humerus would be the most frequent seat of ununited fracture in the upper limb, while in the lower extremity it is observed that in the lower fragment of the femur and the upper end of the tibia is found the cause of non-union.

Dennis reports thirteen cases of ununited fracture in the humerus in which the upper fragment was the offender in no less than nine instances, and eight ununited fractures of the forearm, in seven of which the cause was found in the lower fragment.

In fractures of the neck of the femur non-union is in part due to the absence of nutrition to the head of the bone, its greatest source of blood-supply having been cut off when the fracture occurred, and the same anatomical law applies equally well to fractures of the neck of the humerus.

Treatment should claim our special attention, as an ununited fracture always proves a source of the greatest discomfort and inconvenience to those who are so unfortunate as to possess them. With this great responsibility devolving upon us, we should employ every effort to permit nothing to go undone for those who have placed their future welfare in our hands.

When the proper time for the union of a fracture has passed, and on removing the dressings we find an ununited fracture with which to contend, what shall be our first duty? Undoubtedly, to apprise the patient of his condition and outline the course of treatment which must be pursued for his permanent relief.

It is seen from the foregoing that the treatment of ununited fractures must be considered, like their causes, both from a local and a constitutional standpoint. It is understood that it must be a combination of these two methods through which we are surely and speedily to bring about the desired results.

In every instance a careful inquiry must be made into the clinical history of the case, that the surgeon may be enabled to combat any local or constitutional trouble which might in any wise interfere with the progress of union.

Every case is a law unto itself, and must be treated accordingly. No fixed set of rules should be for one moment considered in the management of this class of fractures; however, for general purposes, iron and good hygienic surroundings serve our purpose quite well. I have, in some cases, used the phosphates, which appear to be well adapted to the constitutional treatment of ununited fractures, causing an outpouring of osseous material, which readily ossifies and becomes solid.

The above remedies should be considered as our sheet-anchor as regards constitutional medication. In connection with the constitutional treatment, local procedure must be properly and scientifically instituted; this consists in the removal of any foreign substance which may have become lodged between the ends of the fragments, the excitation of an inflammatory condition around the ends of the bones, the approximation of the fragments and the adjustment of a substantial dressing, the one to be preferred depending upon the condition of the case in point.

The operative procedures which have been employed with a view of effecting union in ununited fractures are numerous; however, their ultimate object tends toward one and the same end, the excitation of inflammation, notwithstanding most of the old operations were relegated to oblivion with the advent of aseptic surgery. The use of the seton, the injection of irritating fluids, cauterization of the fragments, electricity, etc., have each and all expended their usefulness, and are no longer considered by the modern surgeon.

Instead of the above procedures (thanks to antiseptic surgery) we now, with almost absolute safety, operate and obtain magnificent results in a very short time, thus overcoming the long and tedious course of the expectant plan of treatment.

The first operation which we shall consider is the drilling of the fragments with a Brainard drill. This operation is simple and unattended with danger if done according to the rules of antiseptic surgery; and, as a matter of fact, under no other circumstances should any operation, however insignificant, be done.

This operation should always be done first, and especially upon patients who for any cause may be unable to undergo a more severe one. It is particularly adapted to old and feeble subjects. The use of an anesthetic is not necessary, the patient complaining very little after the skin has been incised, it having been rendered insensible by the use of cocaine or the ethyl chloride spray. The drill is introduced through the incision in the skin, when, by the proper manipulation of its point, some twenty or thirty holes are drilled in the fragments without once withdrawing the instrument from the skin incision. In this, as in all other operations, the field of work must be rendered perfectly aseptic before the incision is made. When the drilling process is completed, the instrument is removed, the skin closed and sealed with cotton and styptic collodion, thus converting a compound into a simple fracture.

The inflammation produced by the drilling causes a determination of blood to the parts, which carries with it and deposits the material sufficient for the formation of bony union between the fragments. Should the drilling operation prove inefficient, we must resort to a more formidable one, which consists in exposing the false joint through a free incision immediately over the seat of the fracture. Great care must be taken to avoid wounding any of the important vessels and nerves.

Through this incision, with its edges well retracted, the ends of the fragments are completely exposed, from which every vestige of fibrous

tissue is removed, after which the ends of the bone are made to protrude, when a small piece is sawed off of each one, thus securing a fresh bony surface.

The manner of further procedure will depend on whether we have one or two bones with which to deal. If there is but one, it is simply drilled through both fragments, a silver wire of large size passed and the fragments brought together, when the wire is finally twisted and its ends hammered well down against the sides of the bone. Chromicized catgut of large size may be used with good results; ivory or steel pegs are also employed by some surgeons. It is useless to mention that, whatever material is employed, it remains permanently embedded in the tissues.

When there are two bones, as in the forearm and leg, union can not be obtained unless a corresponding section be removed from the sound one, that the broken ends may be brought into apposition.

In some cases of very oblique fractures it is better to resect each fragment by removing half of their thickness for an inch or more and overlapping the fragments which are to be held in apposition by the use of ivory or steel pins. In these resections great care should be taken to preserve the periosteum, as largely upon this depends the formation of new bony tissue.

In extreme cases, when the limb is useless and suppuration is present to such an extent as to endanger life, amputation may become necessary. This state of affairs often follows operations which have been done for the relief of ununited fracture, and is due to necrosis of the bone. In all cases of simple ununited fracture, which are otherwise healthy, I would strongly urge the open operation, with wiring of the fragments, as it most surely affords us the best and safest means of relief.

Should we fail of success in our first attempt, the operation should be repeated as often as becomes necessary to procure relief, as some of the best results obtained have followed the seventh or eighth operation. With proper attention to both constitutional and local means of treatment, we need not fail in securing permanent union in but few instances.

A few words in reference to the use of the X-ray will, I am sure, not prove out of place here. In making a diagnosis, I am free to confess that from the foundation of medicine and surgery no other means has been employed which has proven such a boon to us as the X-ray machine in the diagnosis of fractures, dislocations, and the location of foreign bodies which may have found lodgment in the human economy.

Notwithstanding these facts, to employ the X-ray to the best advantage one must be quite familiar with the workings of the machine, as in different positions of the body it has been frequently observed that any substance in the body that is to be skiagraphed will become somewhat distorted, and even, in many cases, assume an appearance quite foreign to the same object skiagraphed in another position of the body.

The hypothesis of this is that the different angles of light thrown upon the negative produce these different degrees of distortion, depending upon the angle of reflection; consequently, all cases should be skiagraphed both from a side and a front view. For instance, an angular fracture of one of the long bones with considerable deformity may be shadowgraphed from the front of the limb and show no trouble at all, while a side view at once reveals both fracture and displacement, with the angle and degree of deformity.

My reason for mentioning this is to call your attention to the fact that from the use of the X-ray in only one position of the patient we may often have an exaggerated opinion as to the condition of ununited fractures, other fractures, dislocations, and foreign bodies as well.

KENTUCKY STATE MEDICAL SOCIETY.

MINUTES OF THE FORTY-SIXTH ANNUAL MEETING, HELD AT LOUISVILLE, KY., MAY 22, 23, AND 24, 1901.

FIRST DAY—*Morning Session.*

The Society convened in the Scottish Rite Cathedral, and was called to order at 11 A. M. by the President, Dr. James H. Letcher, of Henderson.

The Rev. Carter Helm Jones, of Louisville, offered prayer.

The Hon. Robert Worth Bingham, of Louisville, delivered an eloquent address of welcome, which was responded to in a few well-chosen words by Dr. Thomas Hunt Stucky, of Louisville, in lieu of Dr. Lyman Beecher Todd, of Lexington, who could not be present.

The President then called for the Report of the Committee of Arrangements.

Dr. Louis Frank, Chairman of the Committee, presented his report, stating that the Scottish Rite Cathedral had been selected as the place for holding the sessions of the Society; that the splendid pathologic exhibit of over five hundred specimens was to be seen in one of the side halls. The annual address of the President would be delivered on Wednesday evening at eight-thirty o'clock in the Scottish Rite Cathedral. This to be followed by an address by the Hon. Young E. Allison, of Louisville. On Thursday evening at 7:30 o'clock the local medical profession of Louisville would entertain the Society and its guests by taking them on a moonlight excursion up the Ohio River on the steamer Columbia.

The program was offered by the committee as its report.

On motion, the report was adopted.

The Treasurer's report was then called for, and Dr. Charles W. Aitkin presented the following:

To the President and Gentlemen of the Kentucky State Medical Society:

Your Treasurer takes pleasure in presenting his annual report for the year ending May 1, 1901.

Last year we owed a balance of over three hundred dollars for the publication of our volume of Transactions for 1899. This was paid shortly after our meeting last May, and the volume of Transactions for 1900 has been paid for with the exception of about twenty-five dollars.

The Treasurer desires to express his thanks to the members of the Society who have so promptly responded to his request for the payment of dues, and he recommends to the membership to keep the Society clear of debt by promptly paying their annual mite each year.

I desire to call the attention again this year of the Committee on Credentials to carefully watch for those who have been suspended for non-payment of dues, and who now make application for membership without having paid their indebtedness to the Society. I herewith submit the following itemized financial statement:

RECEIPTS.	
Balance in treasury,	$79 70
Received at Georgetown meeting,	617 25
Received dues during the year,	492 00
	$1,188 95

DISBURSEMENTS.	
Secretary's salary,	$100 00
J. P. Morton & Co.,	331 36
William Whitford, stenographer,	90 10
Dr. J. B. Bullitt's bill,	16 50
Drafts and collections,	10 00
Revenue stamps and postage,	13 71
Stationery and printing,	7 40
Secretary's book,	9 00
Expressage,	1 00
Louisville Medical Journal,	609 88
	$1,188 95

Respectfully submitted,

CHAS. W. AITKIN, *Treasurer.*

On motion, the report was adopted.

Dr. Steele Bailey, the Permanent Secretary, presented the following report:

Mr. President and Gentlemen of Kentucky State Medical Society:

We chronicle with satisfaction the clear-cut and distinctive fact that your Society, as at present organized, is more potent and prosperous than at any time in its history, which embraces a period of more than half a century. Fifty years ago, in April last past, a small but distinguished

coterie of medical gentlemen met in the Senate chamber of the State capitol at Frankfort and organized this Society. It has convened with annual regularity ever since, with the exception of four years during the Civil War, when its meetings were necessarily discontinued. As all know, it has become a great power in diffusing knowledge of medical science, in elevating and improving professional character and conduct, and in advancing the interests and efficiency of the medical profession in the State of Kentucky. There is no mystery concerning all this. Our form of fraternity is pleasing, we have no intangible obstructions to overcome in gaining membership, the annual gatherings are but Meccas of social and scientific solace. But as there is a bitter to every sweet, we must admit our Society is not numerically as great as it should be. We are now but an entity. Times change, and the people improve with the more light thrown upon them; medicine at the dawn of a new century is about to take a new departure. The trend of the hour is for a closer union of the medical profession in Kentucky than now exists. Many of you know of the efforts that are being made by the American Medical Association to bring about more intimate relations of the medical societies in the United States. At the last meeting of the Association a committee was appointed, of which our Dr. J. N. McCormack, of Bowling Green, is Chairman, to consider and recommend a plan for a thorough organization of the profession of this country. In union there is strength; the best results in the mart are obtained by combination and consolidation. A plan which has worked admirably in a few States has been the organization of a medical society in every county in the State, to which belongs every reputable practitioner in that county. In brief, the plan is to rearrange the State societies so that the entire membership of county societies will represent the State Society. If to do were as easy as to know what were good to do, chapels had been churches and poor men's cottages prince's palaces; but we are fully aware of one thing, namely: To obtain recognition for its demands, the profession, of which this Society is an integral part, must act as a unit in all matters of interest to it. To do this it must organize.

A matter of prime necessity to the Society I must mention, though I may be treading upon holy ground in so doing, for the matter was vamped and revamped some three years ago, is to have prepared a new Constitution and By-laws, together with the Code of Ethics of the American Medical Association and the roll of members. By direction of the Society eleven years ago I prepared for the convenience of members the present volume; much of its contents are now obselete; the roster is almost completely changed; to such an extent is it out of date, that when a new member asks for a copy I hesitate in presenting him, vulgarly speaking, my last year's "bird's nest." We should have a new book.

At present our membership is more than five hundred. During the year just past death has removed from their labors three members, viz., Allen H. Kelch, of Louisville; Samuel H. Pangburn, of Maysville; Preston B. Scott;

of Louisville. The two former were men of affairs more than the average physician, faithful and efficient in the discharge of their professional duties; of the latter, Preston B. Scott, it may be said of him that he was a physician and gentleman of the "old school," whose name was a household word in hundreds of homes. The veneration, the confidence and esteem which he inspired in the early years were his until the end, and at his death the people mourned the loss of their counsellor. Memorials of these gentlemen have been prepared by the Committee on Necrology.

Permit me to repeat the request that all removals, that is, changes in post-office address, be made known to the Secretary. In noticing an inaccuracy or omission in the roster, the Secretary would be pleased to have his attention called thereto. Only by having it correct is the roll of members valuable to the Society, or to State societies which are on the exchange list, and we send our volume to every State and Territory, to the Army and Navy Bureaus, to the Hospital Marine Service, and across the "Big Pond" to Bristol, England, in exchange for the Medical Journal published in that metropolis, to Canada, and to every public library in the larger cities.

Dr. Dudley S. Reynolds, of Louisville, who was the appointed delegate to represent this Society at the second annual conference of the Committee on National Legislation of the American Medical Association, held at Washington, February 20–21, 1901, and to whom the Society owes traveling expenses, will make his report at this, the forty-sixth annual meeting.

The well-worn quotation, "who rules o'er freemen should himself be free," which Dr. Johnson's parody, "who drives fat oxen should himself be fat," demonstrated to be more full of sound than sense, might be applied perhaps to a secretary who arranges the program, thus: "who writes the order of proceedings of a medical society should himself never make mistakes." But, as there is no rule without an exception (not even the one so frequently adduced, namely, that a man must be present when he is shaved, the exception to which is found in an absent man's placing himself under the nimble hands of his tonsorial artist), permit me, in lieu of a rule, to present an original Jeremiad and to ask the pardon, not only of the Society, but the gentleman in question, whom I wronged—unwittingly, unintentionally—by omitting his name from the printed program. His title, which should have been on the program, is "Sterilization of Suture Material, with the Exhibition of a New Apparatus." To make the *amende honorable*, I most respectfully beg that on the morning of the second day Dr. August Schachner, of Louisville, be given a time in which to present his paper and his apparatus. I did not discover the *faux pas* until the programs had been printed and were ready to be distributed. You can imagine my chagrin. It is due the essayist, and I trust the Society will grant my wish, promising as I do (and I believe it is my first artless trick) to never, no never again commit a like offense.

All of which is respectfully submitted.

Yours truly, STEELE BAILEY, *Secretary.*

On motion, the report was adopted.

The report of the Committee on Medical Legislation being then called for, Dr. Dudley S. Reynolds read his report, as follows:

REPORT OF COMMITTEE ON MEDICAL LEGISLATION.

Mr. President and Gentlemen of the Kentucky State Medical Society:

The American Medical Association created a Standing Committee, in 1899, on National Medical Legislation, composed of three members: H. L. E. Johnson, District of Columbia; Wm. H. Welch, Maryland; Wm. L. Rodman, Pennsylvania. This committee is to watch all medical and sanitary legislation by Congress. It is provided that this committee shall, in the name of the American Medical Association, ask the Army, the Navy, the Marine Hospital Service, the Bureau of Animal Industry, and each State Medical Society in affiliation with the American Medical Association, to appoint one delegate and one alternate as a permanent Committee on Medical Legislation, to act, whenever it shall appear necessary, on all matters submitted by the Chairman or any of the affiliated bodies. The Central Committee is empowered to call conferences of this composite committee whenever it may appear necessary to propose such legislation as the medical profession may desire, and to prevent such legislation as may appear undesirable or vicious.

In obedience to an official note from your Secretary, I had the honor to accept appointment as your representative in the National Conference.

The first meeting was called for May 1 and 2, 1900, at the National Capitol. Physical injuries disabled me from traveling at that time, and, in accordance with my instructions, I named an alternate, who failed to attend. I was able, however, to aid in the work before the committee by correspondence with our Representative in Congress.

Surgeon General Sternberg reported to the conference his endorsement of three bills—one affecting medical officers in the Army, one allowing the appointment of Surgeons of Volunteers to be Assistant Surgeons in the Regular Army, and one for the relief of Acting Assistant Surgeons.

The Spooner Bill, with reference to creating a Department of Public Health, advocated by Dr. U. O. B. Wingate, of Wisconsin, was read and discussed by the conference. The questionable character of the measure became apparent.

H. R. 11139 and S. 4171, imposing new duties upon the Marine Hospital Service, amending the Act, approved February 15, 1893, with reference to the National Quarantine Laws, after full discussion, were approved, and a committee of five, appointed to look after the Army Medical Bills, was directed to appear before the committees of Congress and urge its passage.

S. 34, known as the Anti-vivisection Bill, was taken up for consideration, and, after discussion, it was decided to ask active aid from each State Society to influence all the members of Congress, as far as possible, to prevent the passage of such a vicious measure.

The second conference was called to meet at Washington, D. C., February 20 and 21, 1901. Most of the States responded to the call. Your representative was present and did what he could to represent what he believes were your views and interests. On motion, the action of the subcommittee was approved.

A call of the States was ordered. Dr. C. S. Rodman reported favorable results of organized influence in the Legislature of Connecticut.

Dr. H. L. E. Johnson asked aid in securing the passage of a bill for improving the water-supply of Washington.

Dr. Emil Amberg, of Michigan, asked a special committee of the American Medical Association to study the question of reciprocity of licensure, on the basis of uniform educational requirements, and make suitable recommendations to the Committee on Legislation of the several State societies.

Dr. L. B. Tuckerman, of Ohio, asked attention to the new law in that State, providing for the examination of all medical students before matriculating in the colleges, as to preliminary education. It has been approved by the Ohio State Medical Society, and has worked so well that all the colleges in Ohio express satisfaction with it. The first year it has been tried resulted in denying the right to matriculate to nearly thirty per cent of all applicants. It is the opinion of your representative that these rejected men should not be matriculated in the colleges of Kentucky.

Dr. Tuckerman announced that Section 150 of H. R. 13423 contains a proviso which, if allowed to pass, will cost the American Medical Association $30,000.00 annually. On motion, Dr. Tuckerman was directed to go at once, on adjournment, to the Senate Committee and ask a hearing. A letter from your representative to Senator Lindsay secured that privilege, and the objectionable features were stricken from the bill.

On motion, the Chair appointed the following Committee on State Examining Boards, with reference to a possible agreement on the exact details necessary to establish reciprocity of licensure on an educational basis: Emil Amberg, of Michigan; Dudley S. Reynolds, of Kentucky, and John B. Roberts, of Pennsylvania.

On motion, the following Committee on State Organization was appointed: C. R. Shinault, of Arkansas; W. P. Goff, of West Virginia, and L. B. Tuckerman, of Ohio. This committee has power to increase its number.

The Chairman announced the passage of S. Bill 4171, giving to the Marine Hospital Service additional power to regulate the coast quarantine.

A copy of the Official Proceedings of the Conference of May 1 and 2, 1900, and of February 20 and 21, 1901, wherein all the matters herein referred to and many others are set forth in detail, is now in the hands of your Secretary.

All of which is most respectfully submitted by

Your humble servant,

DUDLEY S. REYNOLDS.

On motion, the report was adopted.

The President then called for the report of the Committee on Publication.

In the absence of Dr. I. N. Bloom, the Chairman of the committee, Dr. James B. Bullitt offered the annual volume of Transactions as the work of the committee, and called the attention of the members to the fact that this volume was ready for distribution within ninety days after the last meeting of the Society.

On motion, the report was adopted.

The report of the Committee on Topics for Discussion was then called for by the President.

Dr. L. S. McMurty, the Chairman, offered the scientific programme as the report of the committee, and expressed the hope that the members of the Society would take an active part in the discussion of the various papers, and especially the symposiums on obstetrics and that on diseases of children. He thanked the members for the hearty support they had given the committee.

The President called for the report of the Board of Censors, and, in the absence of the Chairman, Dr. J. B. Marvin, the report was postponed.

The Secretary read a telegram of congratulation from Dr. William L. Rodman, of Philadelphia.

On motion, the Society adjourned until 2.30 P. M.

FIRST DAY—*Afternoon Session.*

The Society reassembled at 2.30 P. M., and was called to order by the President.

The "Symposium on Obstetrics" was the first number on the program.

Dr. Edward Speidel, of Louisville, contributed a paper on the "Conduct of the Second Stage of Labor in Private Practice."

Dr. William E. Sleet, of Midway, read a paper on "Some Interesting Experiences in Obstetrics."

Dr. Walker B. Gossett, of Louisville, took up the consideration of "Miscarriage and its Treatment."

Dr. Arthur T. McCormack, of Bowling Green, contributed a paper on "Instrumental and Operative Obstetrics."

The discussion on the papers in the symposium was opened by Drs. Turner Anderson, John A. Lewis, and Frank C. Wilson, and continued by Drs. Blincoe, Richmond, W. H. Wathen, E. C. Smith, Atkinson, Freeman, Greenley, Sargent, Weidner, Tuley, Leavell, Doherty, Thornton, Gilbert, Williams, and in closing by the essayists.

The Committee on Credentials, through Dr. Louis Frank, recommended a number of applicants for membership in this Society, and, on motion, the Secretary was instructed to cast the unanimous vote of the Society for the various candidates recommended, which he did.

At this juncture Dr. Louis Frank introduced an amendment to Article IV, Section 1, which was given its first reading. The amendment is as follows:

Be it Resolved, First, that Article IV, Section 1, be so amended as to combine the office of Treasurer with that of Secretary, making the Secretary also the Treasurer of the Society. Second, that a committee of three be appointed by the chair to fix a suitable remuneration for the Secretary and Treasurer. Third, that any and all parts of the Constitution and By-laws in conflict with the above be repealed, and that the amendment take effect immediately upon is passage by the Society.

On motion, the Society adjourned until 8.30 P. M.

FIRST DAY—*Evening Session.*

The Society reassembled at 8.30 P. M., and was called to order by the Second Vice-President, Dr. George M. Reddish.

Dr. James H. Letcher, of Henderson, the President, then delivered his annual address.

Hon. Young E. Allison, of Louisville, delivered the popular address.

The musical program consisted of a number of well-chosen musical pieces, which were highly applauded, after which the Society adjourned until Thursday morning at 9 o'clock.

SECOND DAY—*Morning Session.*

The Society met at 9 A. M., and was called to order by the President.

Dr. George E. Davis: Mr. President, in order to strengthen the medical profession in the State of Kentucky, and to prevent the impositions on the profession which are now so frequently attempted for the

purpose of forcing the payment of money for various trumped-up reasons, I move that a committee of three be appointed to take under advisement the matter of forming a medical defense union. Seconded.

Dr. Henry E. Tuley: I would like to offer as an amendment to that motion that the committee which was appointed last year to assist Dr. Davis in his suit be continued and take up this question, as suggested in the motion of Dr. Davis, the report to be presented at the next annual meeting. Seconded.

The amendment and the motion as amended were carried.

The President announced that this committee, as appointed last year, consisted of Drs. J. B. Marvin, Arthur T. McCormack, and Urban V. Williams.

The Committee on Credentials, through Dr. Frank, recommended several applicants for membership in this Society.

The Secretary, on motion, was instructed to cast the unanimous vote of the Society for the various candidates recommended, which he did.

Dr. Barton W. Stone: I would like to call the attention of the members of this Society to a matter which was acted on at our meeting at Crab Orchard, but which unfortunately has not received the attention which it deserves. It is very important to the interests of the State and the people. In order to stimulate our activities in that direction, I wish to introduce the following resolution:

Resolved, That this Society reaffirm its position, passed by unanimous vote at its session held at Crab Orchard, that the power to appoint the Superintendents of the Asylums for Insane and Feeble-Minded Institute be remanded to the Boards of Commissioners, and that the Superintendents so appointed shall be empowered to appoint all subordinate officers and employes.

That the members of the Society be requested to urge the passage of a law having the above ends in view upon their Representatives in the next General Assembly, and that such a law should go into effect at the close of the term of office of the present Governor of the Commonwealth.

Dr. Henry E. Tuley: I am pleased that Dr. Stone has brought this matter up again, but I wish to inform the Society that the Governor has already pledged himself to appoint a Commission which is to appoint the Superintendents of the various charitable institutions in the State.

On motion, the Chair was instructed to appoint a committee of three to take up this matter.

The President: I appoint on this committee Drs. Barton W. Stone, Wm. Bailey, and L. L. Robertson.

Dr. Frank's amendment to Article IV, Section 1, was given a second reading.

Dr. C. C. Godshaw: A few days ago there died in this city a man, not a physician, who always took the greatest interest in the work of the medical profession, one who never failed to attend our meetings, and usually in the capacity of representative from the Kentucky State Pharmaceutical Association. I am sure that we have all missed him this year, and feel that suitable resolutions ought to be drafted by us, a copy of which is to be presented to the family of the deceased. I move, therefore, that a committee of three be appointed to draft a suitable memorial on the death of Mr. Joseph B. Larrabee, the son of an ex-officer of this Society. Seconded and carried.

The President appointed on this committee Drs. C. C. Godshaw, Ap Morgan Vance, and John G. Cecil.

Dr. L. B. Cook, Stanford, read a paper entitled "The Clinical Examination of the Blood in Diagnosis."

Dr. Urban V. Williams, of Frankfort, read a paper entitled "Cell Life and the Germs, Considered from the Standpoint of Natural Phenomena."

This paper was discussed by Dr. F. J. Yager, of Campbellsburg.

The President then announced the Symposium on Diseases of Children.

This was opened with the reading of a paper on "Typhoid Fever in Infancy" by James B. Kinnaird, of Lancaster.

In the absence of Dr. Kinnaird, the Secretary was instructed to read the paper.

Dr. Henry E. Tuley, of Louisville, followed with a paper on "A Few Rambling Thoughts on Infant-Feeding."

Dr. Philip F. Barbour, of Louisville, contributed a paper on the "Cure for Enuresis."

The discussion on these papers was opened by Dr. Thos. Hunt Stucky, and continued by Drs. Yager, Gilbert, Carpenter, Leavell, and Richmond.

Dr. William O. Roberts, of Louisville, read a paper on "Hip-Joint Amputation, with Report of a Case."

The committee appointed to draft resolutions on the death of Mr. Joseph B. Larrabee reported through its Chairman, Dr. C. C. Godshaw, as follows:

LOUISVLLE, May 23, 1901.

Your committee appointed to draft suitable resolutions upon the death of Mr. Joseph B. Larrabee, desires to offer the following report:

The Kentucky State Medical Society during its session held in Louisville, Kentucky, has been painfully distressed to learn of the untimely death of Mr. J. B. Larrabee, who always took an active interest in our affairs and contributed both his time and means to make these meetings pleasant and instructive. His amiable, cheerful, and loving disposition has endeared him to the hearts of the members of this Society, and his presence will be sadly missed.

Therefore, be it resolved, That the Kentucky State Medical Society, in body assembled, extend to the family of the deceased our heartfelt sympathy in their sad affliction, and ask the divine Physician to heal their suffering and sorrow.

Resolved, That a copy of this memorial be spread upon the minutes of this meeting, published in our annual records, and a copy of the same sent to the family of the deceased.

C. C. GODSHAW,
AP MORGAN VANCE,
JOHN G. CECIL,
Committee.

The Secretary at this juncture announced the members of the Nominating Committee.

On motion, the Society adjourned until 2 o'clock.

SECOND DAY—*Afternoon Session.*

The Society reassembled at 2 P. M., and was called to order by the President.

Dr. August Schachner, of Louisville, read a paper on "The Sterilization of Suture Material."

This paper was discussed by Dr. J. G. Sherrill, and, in closing, by the essayist.

Dr. Louis Frank, of Louisville, read a paper entitled "Ventral Hernia: Its Prevention and Cure."

Dr. M. F. Coomes, of Louisville, contributed a paper entitled "The Management of the Abscesses of the Antrum of Highmore."

The discussion on this paper was opened by Dr. R. C. McChord, and continued by Drs. Ray, Carpenter, Dabney, Reynolds, and, in closing, by Dr. Coomes.

Dr. Frank, Chairman of the Committee on Credentials, presented a favorable report on a number of applicants for membership, and the Secretary was instructed to cast the unanimous vote of the Society for their election, which he did.

The symposium on Bright's Disease was opened by Dr. Dudley S. Reynolds, of Louisville, with a paper on "The Ophthalmoscopic Diagnosis of Bright's Disease."

Dr. George E. Davis, of Lawrenceburg, followed with a paper on "The Pathology of Bright's Disease."

Dr. Andrew Sargent, of Hopkinsville, contributed a paper on "The Diagnosis of Bright's Disease."

Dr. A. G. Blincoe, of Bardstown, took up the consideration of "The Treatment of Bright's Disease."

The closing paper on the symposium was read by Dr. Leon L. Solomon, of Louisville, who considered "The Indications and Contraindications for Certain Drugs and Measures, and their Employment in the Management of Bright's Disease."

The discussion of these papers was opened by Drs. J. B. Marvin and S. G. Dabney, and continued by Drs. Carpenter, T. H. Stucky, Wm. Bailey; Drs. Reynolds, Davis, and Sargent closed the discussion.

Dr. J. Garland Sherrill, of Louisville, contributed a paper entitled "Analgesia by the Spinal Sub-Arachnoid Injection of Cocaine."

The discussion on this paper was participated in by Drs. Sharp, Gossett, ———, Cartledge, Bullitt, A. T. McCormack, and, in closing, by the essayist.

The proposed amendment to the Constitution, Article IV, Section 1, was again read by the Secretary.

Dr. J. G. Carpenter, of Stanford, read a paper on "Appendicitis: Early Operation from a Pathological Standpoint," after which the Society, on motion, adjourned until Friday morning at 9 o'clock sharp.

THIRD DAY—*Morning Session.*

The Society met at 9 A. M., and was called to order by the President.

The first thing in order was the reading of the report of the Nominating Committee, which was as follows:

President—Dr. T. B. Greenley, Meadow Lawn.
First Vice-President—Dr. George M. Reddish, Somerset.
Second Vice-President—Dr. B. L. Coleman, Lexington.
Permanent Secretary—Dr. Steele Bailey, Stanford.
Treasurer—Dr. Steele Bailey, Stanford.
Librarian—Dr. Frank L. Lapsley, Paris.
Board of Censors—Dr. J. B. Marvin, Louisville; Dr. B. M. Taylor, Greensburg; Dr. A. D. Price, Harrodsburg.

Paducah was selected as the next place of meeting of the Society.

Dr. Frank Boyd was selected as Chairman of the Committee of Arrangements.

On motion, the Secretary was instructed to cast the unanimous vote of the Society for the candidates as proposed, which he did, whereupon they were declared duly elected as officers for the ensuing year.

The proposed amendment to Article IV, Section 1, was given its final reading.

On motion, the amendment was adopted by a unanimous vote.

The President appointed on the committee to consider the Secretary-Treasurer's salary, Drs. Frank, Godshaw, and Lewis.

The report of the Committee on Necrology being called for by the President, the report was offered and read by title:

To the President and Members of the Kentucky State Medical Society:

Your Committee on Necrology make the following report: Since the last meeting of this Society we have been sadly impressed by a rupture of its social relationship in two instances by the death of that number of our members. The communities in which they lived tender their sympathies to us and take cognizance of the ending of two lives characterized by professional excellence and profound social worth, and while they reap the reward which is the consummation of "a good and faithful life" guaranteed by an All-Wise being, we publicly express our sympathies and make known to mankind our deepest regrets by this report, which is to become a part of the Transactions of this Society.

The first to be mentioned is Dr. Samuel Pangburn, of Red Oak, Brown County, Ohio, who died in Maysville, Kentucky, October 4, 1900, after an illness of a few hours. His early education was obtained in the public schools of Ripley, Ohio; later he attended the University at Delaware, Ohio, and Miami College, Oxford. After leaving college in 1859 he commenced the study of medicine under Dr. A. N. Wiley, and at the commencement of the civil war he answered the call of his country "to arms!" After the close of this conflict he again took up his studies, and was graduated from the Medical College of Ohio in 1866. Feeling the great responsibility which must come to one in the practice of medicine, and to fully equip himself, he was graduated from Bellevue Hospital Medical College, New York, in 1868, and began the practice of medicine in Illinois, and later located in Perry, Iowa, and followed his profession with great success. In 1890 he moved to Maysville, Kentucky, where he lived until his death. In 1870 he married Miss Elma J. Keep, of Mexico, Missouri, who survives him. Of four children, two survive him—Elbert, of Maysville, and Harry, recently a Doctor of Medicine from Rush Medical College.

Thus has passed from life's busy scenes a man who by his commendable traits of character builded for himself a name that will be cherished with the deepest reverence. Many silent tears have been shed as memory reverts to him as the embodiment of generous manhood.

The second call was made when Dr. Preston B. Scott passed away. The sad occurrence took place in this city on Monday, September 24, 1900. Preston B. Scott was the oldest son of Col. Robert Wilmot Scott, of Frankfort, Kentucky. He was born September 12, 1832, and after receiving his primary education in the schools of the vicinity in which he lived, he entered Georgetown College at the age of seventeen, from which institution he was graduated with the first honors of his class. Following this he took a course at the University of Tennessee, from which he also graduated with distinction. In 1854 he commenced to lay the foundation for the great superstructure of a medical education. The renowned Dr. Lewis Rogers, his preceptor, rendered him valuable assistance. He was graduated from the Medical Department of the University of Louisville in the spring of 1856, and served as one of the resident physicians to the Louisville City Hospital, shortly afterward beginning to practice in Hickman County, Kentucky, and moved to Boliver County, Mississippi, where he gained extensive practice. He enlisted in the Confederate army at the beginning of the civil war, responding to the first call of the South, and was surgeon of the Fourth Kentucky Infantry, and in a short time was appointed brigade surgeon on the staff of General Ben Hardin Helm. Noting his proficiency, he was advanced to medical director on the staff of General Joseph E. Johnston, and later as medical director on the staff of Lieutenant General Leonidas Polk. After the death of General Polk, Dr. Scott was placed in charge of all the military hospitals in Mississippi and Alabama, in which position he acted until the close of the war. In 1865 he

returned to his native State and entered the practice of medicine and surgery, and advanced rapidly toward the head of the profession, and occupied many positions of honor during his eventful career, such as physician to Masonic Widows' and Orphans' Home, Episcopal Orphan Asylum, President of the Academy of Medicine and Surgery in the Polytechnic Society of Kentucky, and President Louisville Medical Society.

He was a man to be emulated in refinement of ways and culture; clear and accurate in judgment; the highest sense of moral right; unerring in his conclusions; possessing all the virtues which bring conviction to one's self, and from which (when once fixed) no falter or turning; duty his guide, enthused with the Scriptural injunction, "in love preferring one another." He was deeply interested in the comfort and enjoyment of his associates, and lived a life supported by that warmth of heart which debars hesitancy or critical investigation when in his presence. He lived a gentleman and died a Christian. What more can be said?

C. C. LEWIS, *Chairman.*

In accordance with a suggestion embodied in the President's annual address, Dr. Boyd moved that a committee be appointed to make a general revision of the Constitution and By-Laws of the Society, said committee to present their report at the next annual meeting.

Dr. J. N. McCormack: I think this is a step in the right direction, but if this work is going to be done, let us do it right. I suggest that this committee make their work conform as nearly as possible to the work of the Committee on Reorganization of the American Medical Association. I offer that as an amendment to Dr. Boyd's motion.

Dr. Boyd: I accept the amendment.

On motion, the amendment and the motion as amended were adopted.

The President: I appoint on this Committee, Drs. Frank Boyd, Henry E. Tuley, and Steele Bailey.

The Committee to assist Dr. George E. Davis' suit in Court of Appeals signifying their readiness to report, the President called on Dr. J. B. Marvin.

Dr. Marvin: Your Committee wish to report that about $150.00 has been subscribed to the fund, of which amount only $6.00 has been paid in. We believe it would be proper for the Society to support and endorse Dr. Davis' action in this matter, so as to give it the sanction of the medical profession of the State. It would be still better to have the State Board of Health take up the matter, as the work is really in line with the up-holding of the medical laws.

On motion, the report was accepted.

On motion of Dr. Reynolds, a subscription list was started then and there, and the President appointed Dr. Vance to collect the subscriptions.

Dr. Davis, in a few well-chosen words, thanked the Society for its support and encouragement, both financially and otherwise.

Dr. Henry H. Koehler, of Louisville, read a paper entitled "Stricture of Male Urethra: A Resumé of the Present Methods of Treatment."

This paper was discussed by Drs. Wathen, Jr., Blue, Yager, Vance, and, in closing, by the essayist.

Dr. William R. Blue, of Louisville, read a paper on "Urethroscopy."

Dr. J. N. McCormack, of Bowling Green, contributed a paper on "The Necessity of Medical Education."

This paper was also offered by Dr. McCormack as the report of the Committee on Public Policy.

On motion, the report was adopted.

The paper was discussed by Drs. Mathews, Richmond, Reynolds, Weidner, Vance, Godshaw, and, in closing, by the essayist.

Dr. J. M. Mathews then introduced the following resolution:

Resolved, That this Society endorses the essential features of the plan of organization outlined in the report to the American Medical Association, and hereby instructs its delegates to that body to give its support.

Resolved, further, That the President of this Society be requested to appoint a Committee on Organization of three members to take into consideration the present condition of the profession in Kentucky, and to report such changes and amendments to our Constitution and By-Laws as in its judgment will promote the best interests of the profession.

On motion, this resolution was unanimously adopted.

Dr. Ancil D. Price, of Harrodsburg, read a paper entitled "The Imperative Necessity of General Vaccination."

The discussion on this paper was opened by Dr. T. J. Shoemaker, and continued by Drs. Yager, Gilbert, ———, J. N. McCormack, and ———.

Dr. A. M. Morrison, of Goshen, contributed a paper entitled "A Gunshot Wound of the Right Lung with Complication."

Dr. J. L. Atkinson, of Campbellsville, read a paper entitled "Report of Two Cases of Aneurism."

Dr. Ben Carlos Frazier, of Louisville, read a paper on "Tubercular Peritonitis."

On motion, further discussion was dispensed with, and the balance of the papers on the program were read by title.

On motion of Dr. Bullitt, the Treasurer was ordered to pay the bill of Dr. Reynolds for expenses of going to Washington as a Delegate to Committee on National Legislation. He moved, further, that in future the Committee pay their own expenses. Carried.

The motion to the effect that the Committee on Legislation be abolished was lost.

The report of the Committee on Secretary-Treasurer's salary was then called for by the President.

Dr. Frank: Seventeen years ago the Society, then having only a few members, voted the Secretary, Dr. Steele Bailey, a salary of $100.00 a year. To-day we have 615 members, and the Secretary now has an additional office to fill, that of Treasurer. This will add considerably to the work of that officer. Your Committee recommend, therefore, that Dr. Steele Bailey, as Secretary-Treasurer of this Society, receive a salary of $300.00 per year.

On motion of Dr. Bodine, this report was adopted.

Drs. Marvin and Skillman were appointed to escort the President-elect to the Chair.

Dr. Greenley was received amidst much applause, and was introduced by Dr. Marvin, as follows:

Friends, beloved, faithful yoke-fellows: I am proud to stand on the platform with two such representative doctors. Gentlemen of the Kentucky State Medical Society, allow me to present to you the President-elect, a gentleman eighty-three years young, whose eyes are not dim, whose knees are not weak, whose faculties are not weak, who is active. A man who never misses a meeting of his County, State, or National Society; a man who is present at the first session; a man who is always present at every session; a man who sometimes with the President and our esteemed Secretary, Dr. Steele Bailey, closes the meeting; a man who always has a paper. Gentlemen, we are proud to honor ourselves by electing such a man President. I introduce to you Dr. T. B. Greenley, of Meadow Lawn.

Dr. Greenley, in accepting the Presidency, said:

Gentlemen, I feel so full of gratitude that I am utterly unable to express to you my appreciation of the honor you have conferred on me; an honor which was entirely unsolicited, and therefore all the greater honor. I feel that I am perhaps in the same place as Adam, of Eden, when Eve offered him the apple. He did not solicit the apple, but nevertheless took

and partook of it, but I hope that my accepting this honor will not eventuate in such trouble as did the taking of the apple by Adam from Eve. I am pleased also that such an able helper as Dr. Reddish was appointed as my senior assistant to assist me in the work. I promise you that I will do the best in my power to preside over you well, and hope I will have the cordial assistance of you all. I again thank you for your extreme kindness. (Applause.)

The following papers were read by title:

1. "Practical Management of Smallpox," by Dr. M. K. Allen, of Louisville.

2. "Ununited Fractures and Their Treatment," by Dr. J. Lively Johnson, of Louisville.

3. "Surgical Emergencies from a Medico-Legal Standpoint," by Dr. C. C. Godshaw, of Louisville.

4. "Surgical Treatment of Inguinal Hernia," by Dr. J. T. Dunn, of Louisville.

5. "The Longevity of the People of Seventy Years and Over Living in the Valley Below the City of Louisville, Called the Ponds Settlement, Within the Last Half-Century," by Dr. T. B. Greenley, of Meadow Lawn.

On motion, a vote of thanks was extended to the profession of Louisville for the hospitality which they extended to the visiting members at the Society. A rising vote was taken. It was unanimous.

On motion, a vote of thanks was extended to the retiring President, Dr. Letcher, for the able and impartial manner with which he had presided over the deliberations of the Society.

Dr. Letcher appreciated the compliment which the Society had paid him, and referred to the fact that when he was Secretary, during 1879, the Society had held what was up to then the largest meeting, the meeting at which a monument had been dedicated to Drs. Gross and Sayre, and now it had been his good fortune to be presiding officer at the largest meeting the Society has ever had, and with a membership of over 600. He said he was proud to have had the opportunity to officiate at two such momentous occasions. He also thanked the members of the Society for the support which they had given him.

On motion, a vote of thanks was extended to the other officers of of the Society for the excellent work they had done.

On motion, a vote of thanks was extended to the Pathologic Exhibit Committee for their efforts, which had resulted in such a creditable display.

The President appointed the following Committees:

Board of Censors—J. B. Marvin, Louisville; B. M. Taylor, Greensburg, and A. D. Price, Harrodsburg.

Committee on Public Policy—Ap Morgan Vance, Louisville, and Jos. M. Mathews, Louisville.

Committee on Necrology—J. B. Marvin, Louisville; J. B. Kinnaird, Lancaster, and Thos. J. Shoemaker, Morganfield.

Committee on Topics for Discussion—Louis Frank, Louisville; Jas. B. Bullitt, Louisville; A. T. McCormack, Bowling Green; Henry E. Tuley, Louisville, and F. H. Clark, Lexington.

Committee on Publication—M. F. Coomes, Louisville; H. Horace Grant, Louisville, and Steele Bailey, Stanford.

Committee on Pathologic Exhibit—Jas. B. Bullitt, Louisville; John G. Cecil, Louisville, and Charles C. Lewis, Owensboro.

Committee on National Legislation—Dudley S. Reynolds, Louisville; Samuel M. Willis, Pine Grove, and Isaac Townes, Beech Grove.

Committee to Prepare Resolutions Against Anti-vivisection Bill—John G. Brooks, Paducah; R. C. McChord, Lebanon, and Wm. Cheatham, Louisville.

Committee on Asylums—Barton W. Stone, Louisville; L. L. Robertson, Middlesboro, and William Bailey, Louisville.

Committee on Transportation—

There being no further business to come before the Convention, the Society, on motion, adjourned, to meet in Paducah in May, 1902

STEELE BAILEY, M. D.,
Permanent Secretary.

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